DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 17-107830-LO

Project Name/Address: CIty of Bellevue Utilities Woodridge Open Space Sewer Replacement / 1121 Lakes Hills Connector

Planner: Drew Folsom

Phone Number: 425-452-4441

Minimum Comment Period: April 6, 2017

Materials included in this Notice:

☒ Blue Bulletin
☒ Checklist
☒ Vicinity Map
☒ □□□Plans
☒ □□□Other:

OTHERS TO RECEIVE THIS DOCUMENT:
☒ State Department of Fish and Wildlife / Sterwart.Reinbold@dfw.gov; Christa.Heller@dfw.wa.gov;
☒ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
☒ Army Corps of Engineers Susan.M.Powell@nws02.usace.army.mil
☒ Attorney General ecyolyef@atg.wa.gov
☒ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

City of Bellevue Submittal Requirements	27

ENVIRONMENTAL CHECKLIST

10/9/2009

If you need assistance in completing the checklist or have any questions regarding the environmental review process, please visit or call the Permit Center (425-452-6864) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Our TTY number is 425-452-4636.

BACKGROUND INFORMATION

Property Owner: City of Bellevue – Parks Department

Proponent: Contact Person: City of Bellevue Utilities Dept. Birol Shaha, PE / Senior Engineer
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Address: P.O. Box 90012 – Bellevue WA 98009-9012

Phone: 425-452-4477 (Birol Shaha)

Proposal Title: Woodridge Open Space Sewer Replacement Project

Proposal Location: Between 128th Avenue SE and Lake Hills Connector
Township 24 North, Range 5 East, Section 4

(Street address and nearest cross street or intersection) Provide a legal description if available.
Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site.

MAR - 3 2017
Permit Processing

3/21/17

Give an accurate, brief description of the proposal's scope and nature:

1. General description: The City of Bellevue Utilities Department (hereafter referred to as the City) proposes to replace an aging sewer pipeline with approximately 1,275 feet of 8-inch diameter high-density polyethylene (HDPE) pipe. The existing and replacement pipelines traverse a hillside within the Woodridge Open Space, which is managed by the City of Bellevue Parks and Community Services Department. The existing sewer pipeline is deteriorated as it has exceeded its design life. As a result, the City recently repaired a leaking section of pipe and there is potential for other leaks along the pipeline. The replacement pipeline will be constructed primarily on the existing ground surface. Portions of the pipeline will be buried to connect to manholes at the upstream and downstream extents, to cross under an existing trail, and to facilitate gravity flow. The replacement pipeline will span over two streams. Above ground portions of the existing pipeline will be removed once the new pipeline is installed. Below ground, portions will be abandoned in place. This pipeline replacement project is part of the City's ongoing sewer system renewal and replacement program.

2. Acreage of site: 0.75 acres
3. Number of dwelling units/buildings to be demolished: N/A
4. Number of dwelling units/buildings to be constructed: N/A
5. Square footage of buildings to be demolished: N/A
6. Square footage of buildings to be constructed: N/A
7. Quantity of earth movement (in cubic yards): 60 cubic yards
8. Proposed land use: No change in land use -- sewer line replacement.
9. Design features, including building height, number of stories and proposed exterior materials: N/A
10. Other

    Estimated date of completion of the proposal or timing of phasing: December 2017

2/21/17

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No.

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

(1) Critical Areas Report and Mitigation Plan - Woodridge Open Space Sewer Replacement. Prepared by Herrera Environmental Consultants. ~~February 28, 2017.~~ March 21, 2017

(2) Technical Memorandum - Construction Options to Cross Lower Stream Channel - Woodridge Open Space Sewer Replacement Project. Prepared by Tetra Tech, Inc. December 1, 2016.

(3) Geologic Hazard Areas Report - Woodridge Sewer Replacement Phase 2, Prepared by Shannon & Wilson, Inc. January 20, 2017.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

No applications are currently pending.

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

1. Critical Areas Land Use Permit, City of Bellevue
2. Clearing and Grading Permit, City of Bellevue
3. Right-of-Way Street Use Permit, City of Bellevue
4. Hydraulic Project Approval, Washington Department of Fish and Wildlife

Please provide one or more of the following exhibits, if applicable to your proposal. (Please check appropriate box(es) for exhibits submitted with your proposal):

Land Use Reclassification (rezone) Map of existing and proposed zoning

Preliminary Plat or Planned Unit Development
Preliminary plat map

X Clearing & Grading Permit
Plan of existing and proposed grading
Development plans

Building Permit (or Design Review)
Site Plan
Clearing & grading plan

Shoreline Management Permit
Site plan

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A. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: Rolling Hilly Steep slopes Mountains Other

b. What is the steepest slope on the site (approximate percent slope)?

40 percent

c. What general types of soil are found on the site (for example, clay, sand, gravel, peat, and muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Arents/Alderwood gravelly, sandy loam underlain by glacial and Kitsap silt loam underlain by silty clay loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

All of the soil on the hillside is considered to be subject to severe erosion hazard, and includes areas designated as steep slopes (greater than 40 percent). One part of the hillside, about 150 feet wide by 310 feet long, continues to be slowly moving. This part of the slope is hummocky and wet, has a three to four-foot headscarp, and is bulging at the toe. Alders on the slope are leaning 10 to 40 degrees downhill. At the toe of the landslide the existing sewer pipe has been deflected about 15 degrees by the moving earth. Elsewhere on the hillside, it appears that old cut slopes have sloughed due to past disturbance. Upslope of the existing alignment there are deep erosional incisions, shallow sloughing and groundwater seeps.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Excavation of a temporary trench will be needed for the portions of the pipe that will be buried to connect to manholes at the upstream and downstream extents, to cross under an existing trail, and to facilitate gravity flow. Approximately 60 cubic yards of existing soil will be excavated and then backfilled after the new sewer pipe is installed. Approximately 0.5 cubic yards of crushed rock/gravel will be imported from an approved source and placed as fill beneath a new manhole to provide structural support. In addition, 3-cubic yard concrete anchor block will be installed around the pipeline at the uphill extent of the project. No other fill is proposed.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could occur during construction activities, particularly earthwork.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

No new buildings or asphalt are associated with the project.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The pipeline alignment was selected to conform to the natural contour of the hillside and avoid, to the extent practicable, areas of steep slopes (greater than 40 percent). Excavations will be minimized to avoid ground disturbance, and natural drainage will not be impeded. Improvements are located to preserve the most critical parts of the slope, including avoiding the actively moving landslide deposit. Open-cut areas will avoid wetlands. The contractor will implement a Temporary Erosion and Sediment

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Control (TESC) Plan.

2. Air

a. What types of emissions to the air would result from the proposal (i.e. dust, automobile odors, and industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

During construction activities, there may be a small increase in exhaust emissions from construction vehicles and equipment, and a temporary increase in dust due to temporary access/staging area construction. Emissions from construction vehicles, as well as emissions from construction worker's vehicles, will contribute greenhouse gases to the atmosphere during this brief period. Operation of the project will not create emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off site sources of emissions or odor that will affect the project.

c. Proposed measures to reduce or control emissions or other impacts to the air, if any:

Measures during construction to minimize impacts on air quality will include:

- Spray exposed soil and storage areas with water during dry periods
- Remove particulate matter deposited on paved, public roads and sidewalks to reduce mud and dust; sweep and wash streets frequently to reduce emissions
- Equip construction equipment with appropriate emission controls

3. Water

a. Surface

(1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into it.

Five wetlands occur in the project area which are slope wetlands associated with seeps and streams. These wetlands are palustrine forested and scrub-shrub according to the Cowardin classification system, and are Category III according to the Washington State Department of Ecology wetland rating system, which the City of Bellevue adopted. In addition, four streams occur in the project area that are classified as Type N. There are no fish documented in any of these streams. These streams had flow during field investigations, but may be dry during summer months. All of the streams are tributary to Richards Creek, which flows into Kelsey Creek, which flows into Mercer Slough and eventually Lake Washington. DD STREAM 3, NPR-F, SEE CRITICAL AREAS REPORT TABLE 13 D.2

(2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If Yes, please describe and attach available plans.

As a result of the proposed project, there will be unavoidable permanent impacts to Wetlands A, B, and C; Streams 1 and 3; and buffers. In addition, there will be temporary impacts to Wetlands A, B, and C; Stream 4; and buffers. Permanent impacts will occur where the proposed sewer pipeline is installed

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(footprint of pipe), while construction and staging areas represent areas of temporary impacts. Permanent impacts include stream impact of 12 square feet, wetland impact of 110 square feet, and buffer impact of 663 square feet. Temporary wetland impacts of 553 square feet and temporary buffer impacts of 14,085 square feet will occur due to construction access; clearing and grubbing vegetation; and excavation and backfill during pipeline installation.

(3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

(4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The project will not require surface water withdrawals or diversions.

(5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The project does not occur within a 100-year floodplain.

(6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The project does not involve discharge of waste materials to surface waters.

b. Ground

(1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description.

Groundwater will not be withdrawn and no water will be discharged to ground water.

(2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.) Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground.

c. Water Runoff (Including storm water)

(1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Throughout project construction and operation, stormwater will be the primary source of water runoff. Stormwater that runs off the construction site will be filtered through silt fences and then will disperse onto surrounding vegetated areas. After construction, the majority of the project area disturbed will be restored to preconstruction conditions, with a negligible change expected in site runoff. The project area is in the Mercer Slough basin that drains to Lake Washington.

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(2) Could waste materials enter ground or surface waters? If so, generally describe.

Runoff from the construction sites has the potential to contain sediment in addition to small amounts of equipment-related materials such as motor oil, diesel fuel, hydraulic fluid, etc.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the project. The project will be constructed in accordance with applicable state and local permits, which specify a range of Best Management Practices (BMPs) and TESC measures designed to control potential surface, ground, or runoff water impacts.

The project will minimize erosion and sedimentation by constructing pipeline bridges over Streams 1 and 3, and completely avoiding Stream 2. In addition, erosion and sedimentation will be minimized by constructing the pipeline primarily on the ground surface thereby minimizing disturbance to vegetation and soils. The proposed project design has avoided and minimized wetland impacts to the extent possible by selecting a pipeline alignment that completely avoids Wetlands D and E and limits impacts to Wetlands A, B, and C. Where intrusion into these wetlands is necessary, careful consideration was given to minimizing impact to the outer edges of wetlands or by crossing relatively narrow portions of the wetlands. Once construction is complete, construction and staging areas disturbed during construction of the pipeline will be restored with native vegetation consisting of trees, shrubs, and groundcover.

4. Plants

a. Check or circle types of vegetation found on the site:

deciduous tree: alder, maple, aspen, other

evergreen tree: fir, cedar, pine, other

shrubs

grass

pasture

crop or grain

wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other: *lady fern, horsetail, piggy-back plant*

water plants: water lily, eelgrass, milfoil, other

other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Approximately 0.33 acres of vegetation consisting of mixed coniferous-deciduous forest and shrubs will be cleared. Vegetation clearing will primarily be cleared within the two designated staging areas. Along the pipeline alignment, vegetation will only be cleared as necessary to facilitate pipeline installation. Up to 20 significant trees could be removed within staging areas and along the pipeline alignment. The contractor will only clear trees within these areas that are necessary to construct the project. All trees removed will stay on site as downed wood habitat structure. No street trees will be removed.

c. List threatened or endangered species known to be on or near the site.

No threatened or endangered plant species are known to be present on or near the site.

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d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The pipeline alignment was carefully selected to preserve significant trees to the maximum extent within wetland and buffer areas. Impacted areas will be restored by planting native trees, shrubs, and groundcover, and removing invasive nonnative vegetation. Buffer habitat will be enhanced to compensate for permanent impacts. Enhancement measures will include removing invasive and nonnative vegetation (e.g., laurels) and planting native vegetation including trees, shrubs, and groundcover. At stream crossing locations, conifer trees will be planted in the buffer to increase the conifer density of the forest.

5. Animals

a. Check or circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

Birds: hawk, heron, eagle, songbirds, other: *Pileated woodpecker*

Mammals: deer, bear, elk, beaver, other:

Fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

There are no threatened or endangered animal species known to be on or near the site.

c. Is the site part of a migration route? If so, explain.

The project site, along with the entire Puget Sound region, is located within the Pacific Flyway, which is a flight corridor for migrating waterfowl and other birds. The Pacific Flyway extends south from Alaska to Mexico and South America.

d. Proposed measures to preserve or enhance wildlife, if any:

The project design minimizes impacts on wildlife by minimizing the construction footprint to the extent possible; providing protection measures for all trees that could be damaged by construction activities; and implementing plans, including a SWPPP and TESC Plan, to protect aquatic life by preventing sediment transport from the project site. The planting of conifer tree species in the stream buffer will, over time, enhance habitat for pileated woodpeckers and other terrestrial wildlife species.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy need? Describe whether it will be used for heating, manufacturing, etc.

The completed project will not have any energy needs.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project will not affect solar energy use by adjacent properties.

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c. **What kinds of energy conservation features are included in the plans of the proposal? List other proposed measures to reduce or control energy impacts, if any:**

The completed project will not have energy impacts; therefore, no conservation or mitigation measures are proposed.

7. **Environmental Health**

a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.**

There are no known sources of toxic chemicals or hazardous waste in the vicinity of the site. As with any construction project, the proposed project involves a risk of construction related spills or leaks. The proposed project will implement a Spill Prevention, Control, and Countermeasures (SPCC) plan, so it will have a relatively low risk for spills or leaks. No toxic chemicals will be used or stored at the construction sites, other than fuels and other construction-related fluids.

(1) Describe special emergency services that might be required.

The proposed project could result in a minor increase in the potential for accidents that could require emergency services, but it is unlikely to require special emergency services.

(2) Proposed measures to reduce or control environmental health hazards, if any.

The construction contractor will prepare a health and safety plan as part of the contract for the proposed project. This plan will comply with all applicable health regulations and will detail measures to control environmental health hazards.

b. **Noise**

(1) What types of noise exist in the area which may affect your project (for example, traffic, equipment, operation, other)?

Common noise sources within the project area include road traffic, overhead airplanes, and mechanical equipment. These noises are not expected to affect the project.

(2) What types and levels of noise would be created by or associated with the project on a short-term or long-term basis (for example, traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction of the project is expected to cause short-term noise impacts in areas near the construction activity. Construction noise will only occur during City of Bellevue allowable work hours. Allowable work hours are between 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays that are not legal holidays (Bellevue City Code Chapter 9.18.020 C.). Construction noise will consist of engine noise, and mechanical and scraping noises associated with the use of construction equipment.

(3) Proposed measures to reduce or control noise impacts, if any:

To reduce noise impacts during construction, the following measures will be followed:

- Minimize idling time of equipment and vehicle operation
- Use well-maintained and properly-functioning equipment and vehicles
- Provide electricity from the power grid and encourage the use of electrical or hydraulic tools whenever practicable

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- **Notify residents and businesses near active construction areas of upcoming noisy construction activity**

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

There are several hiking trails through the Woodridge Open Space. Single-family residences surround the study area on the west and south sides of the site, while Lake Hills Connector Road and 132nd Avenue SE border the north and east sides.

b. Has the site been used for agriculture? If so, describe.

The site has not been used for agriculture.

c. Describe any structures on the site.

There are no structures on the site except for the existing sewer and trails.

d. Will any structures be demolished? If so, what?

No structures will be demolished. After the new sewer is installed and operational, above ground portions of the existing sewer will be removed.

e. What is the current zoning classification of the site?

The site is zoned low density residential (R - 3.5).

f. What is the current comprehensive plan designation of the site?

The site is designate as the Woodridge Open Space City Park in Bellevue's Comprehensive Plan.

g. If applicable, what is the current shoreline master program designation of the site?

Shoreline master program designations to not apply to the site.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

The site is designated by the City of Bellevue as a severe soil erosion hazard area and contains areas with steep slopes (greater than 40 percent).

I. Approximately how many people would reside or work in the completed project?

No people will reside or work in the completed project.

j. Approximately how many people would the completed project displace?

The completed project will not displace any people.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Displacement will not occur as a result of the project; therefore, mitigation measures have not been developed.

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i. **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:**

The proposal is compatible with the existing parkland uses of the site.

9. **Housing**

a. **Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

None

b. **Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

None

c. **Proposed measures to reduce or control housing impacts, if any:**

Does not apply

10. **Aesthetics**

a. **What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**

The pipe bridge over Stream 1 will be approximately five feet tall, and will be constructed of steel.

b. **What views in the immediate vicinity would be altered or obstructed?**

The above ground portions of the pipeline and the pipeline bridges could be visible to the public from trails.

c. **Proposed measures to reduce or control aesthetic impacts, if any:**

Once construction of the pipeline is complete, construction and staging areas disturbed during construction of the pipeline will be restored with native vegetation consisting of trees, shrubs, and groundcover. The vegetation will grow to cover the pipeline within a few years, retaining the aesthetics of the Woodridge Open Space for park users.

11. **Light and Glare**

a. **What type of light or glare will the proposal produce? What time of day would it mainly occur?**

There will be no light or glare produced by the proposal.

b. **Could light or glare from the finished project be a safety hazard or interfere with views?**

Does not apply.

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c. What existing off-site sources of light or glare may affect your proposal?

Does not apply.

d. Proposed measures to reduce or control light or glare impacts, if any:

Does not apply.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The proposed pipe crosses the Woodridge Trail. A half-mile loop trail provides Woodridge residents access to Richards Road, the Lake to Lake Trail, and Richards Valley Trail system.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Short-term trail closure may be required during construction for park access, staging, and pipe crossing. Closure will last approximately one day.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The City of Bellevue will coordinate and provide advance notification of work near the trail. Access to and use of the trail will be controlled by signs and flaggers during project construction.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

A review of historic registers indicates that there are no properties listed on or determined eligible for listing on the National Register of Historic Places or Washington Heritage Register near the project area (DAHP 2016).

b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.

There is no known evidence of Indian or historic use or occupation of the site.

c. Proposed measures to reduce or control impacts, if any:

Should cultural resources be encountered during project construction, the City will comply with state laws requiring the protection of cultural resources and human remains (RCW 27.53, RCW 27.44, RCW 68.50, and RCW 68.60). The City will temporarily halt work in the immediate vicinity of the identified resources and will notify DAHP and affected tribes to negotiate mitigation and/or avoidance measures prior to proceeding with work.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the

existing street system. Show on site plans, if any.

The site is accessed via 128th Street SE and the Lake Hills Connector. Temporary staging areas will be constructed on the site adjacent to the access points from existing streets. No access roads will be built along the pipeline alignment.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Woodridge Open Space is served by King County Metro Transit system routes 246 and 240.

c. How many parking spaces would be completed project have? How many would the project eliminate?

The project will not create any parking spaces.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

The project will not require any new roads or streets or improvements to existing roads or streets.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project will not use, or interfere with, water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

The project will not generate any traffic.

g. Proposed measures to reduce or control transportation impacts, if any:

Use flaggers to minimize potential conflicts between construction activities and non-construction traffic, including vehicle, bicycle and pedestrian traffic on Lake Hills Connector and 128th Avenue SE

- To the extent practicable, schedule truck traffic to avoid peak commute hours
- Require construction vehicles to follow major arterial routes to the maximum extent practicable
- After construction, project operations will not affect the transportation system.

15. Public Services

a. Would the project result in an increased need for the public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

The project will not result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Impact on public services is not expected, therefore no mitigation measures are proposed.

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16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, cable tv.

City of Bellevue provides water, sewer, and stormwater utilities in the vicinity.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity, which might be needed.

City of Bellevue will be responsible for ongoing maintenance of the sewer pipe.

Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature.....

Date

Submitted.....03/3/17.....

Woodridge Open Space Sewer Replacement Project – List of Exhibits

1. **Vicinity Map**
2. **Development Plans** - 60% Design Review Set attached.

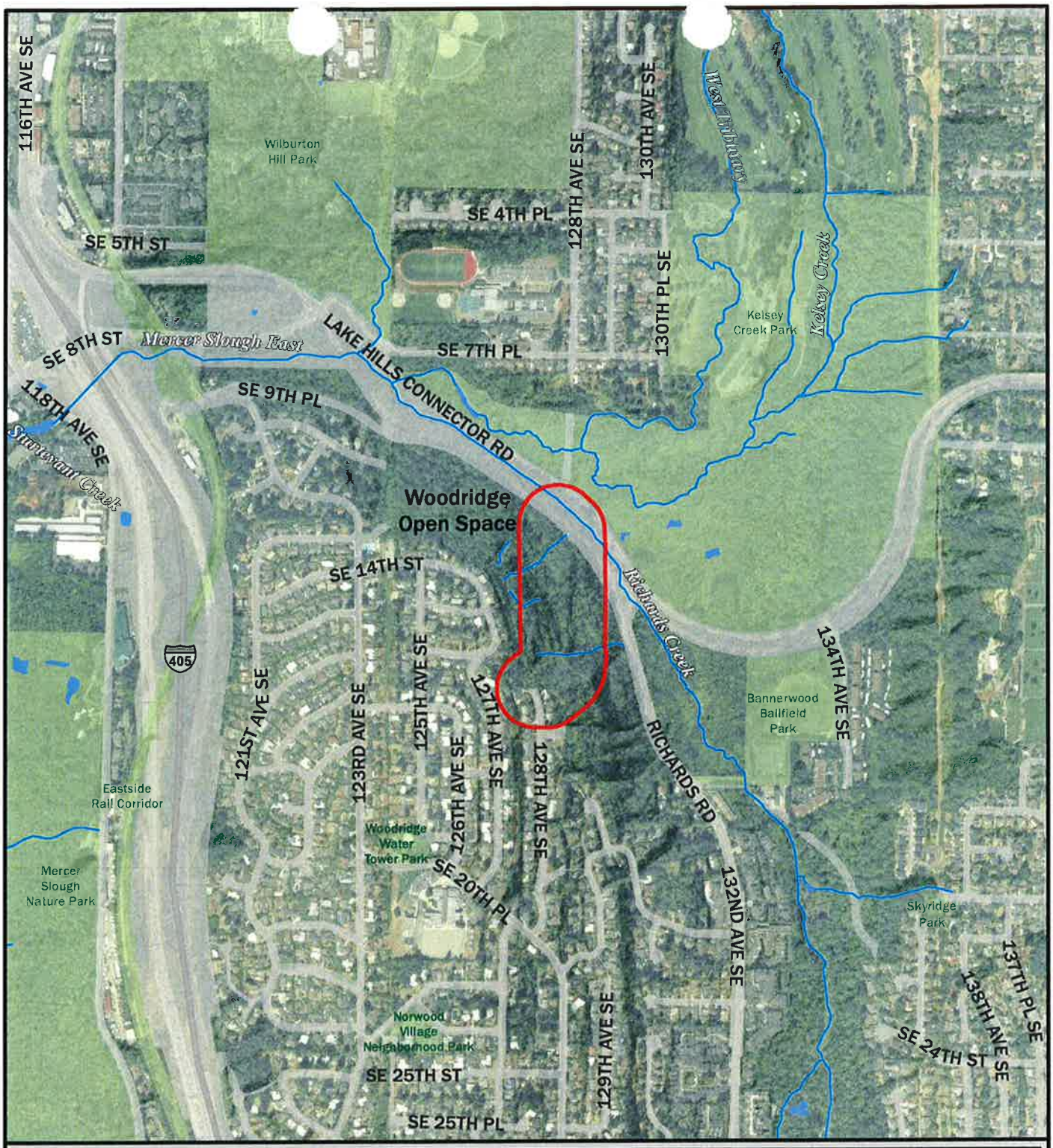

Figure 1.
Vicinity Map for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

CITY OF BELLEVUE

UTILITIES DEPARTMENT

WOODRIDGE OPEN SPACE SEWER REPLACEMENT

C.I.P. # S-66

CITY OF BELLEVUE

MAYOR
JOHN STOKES

DEPUTY MAYOR
JOHN CHELMINIAK

CITY COUNCIL
CONRAD LEE
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CITY MANAGER
BRAD MIYAKE

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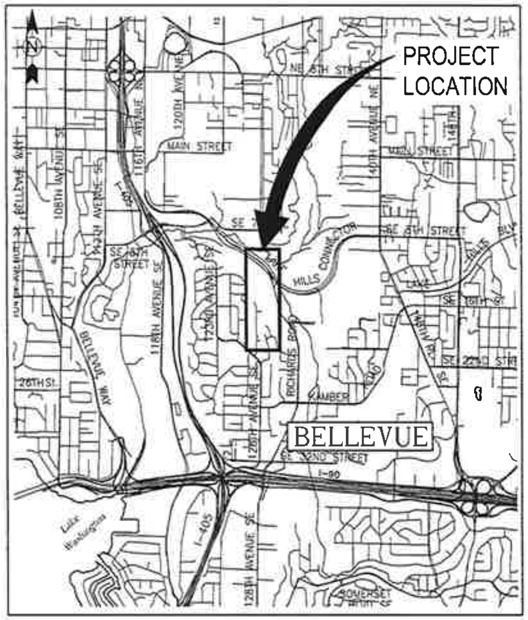
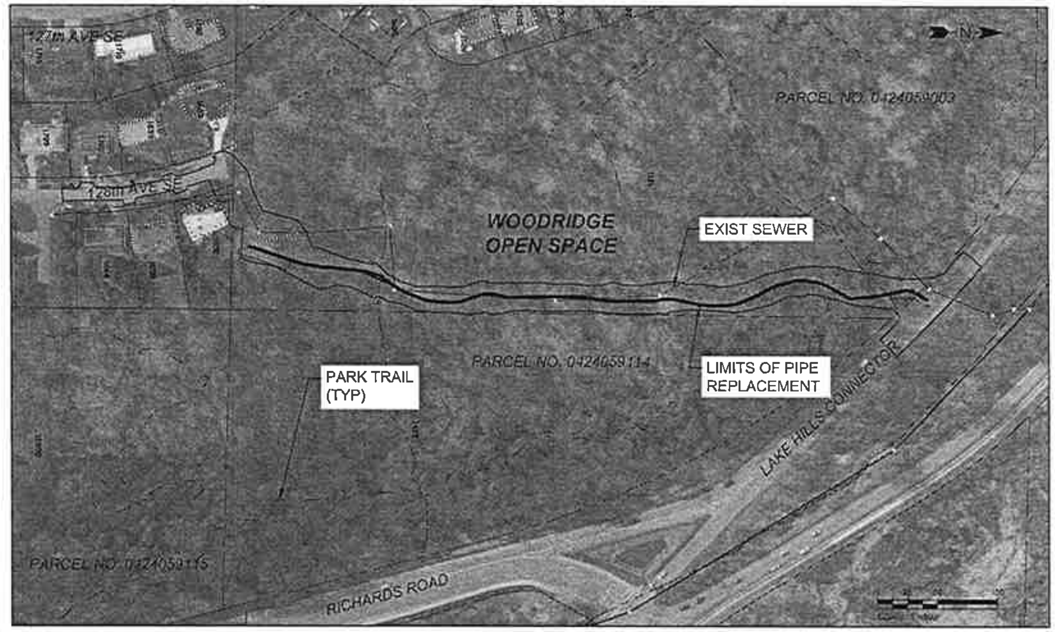


VICINITY MAP



LOCATION MAP

DRAWING INDEX

GENERAL

1	G-01	TITLE SHEET, LOCATION MAP, AND DRAWING INDEX

CIVIL

2	C-01	GENERAL NOTES AND DETAILS
3	C-02	TRAFFIC CONTROL PLANS
4	C-03	PLAN AND PROFILE STA 10+16 TO 14+60
5	C-04	PLAN AND PROFILE STA 14+60 TO 19+00
6	C-05	PLAN AND PROFILE STA 19+00 TO 21+76
7	C-06	CONSTRUCTION AREA NEXT TO LAKE HILLS CONNECTOR
8	C-07	CONSTRUCTION AREA NEXT TO 128TH AVE SE
9	C-08	PIPE BRIDGES
10	PP-01	PLANTING 1 OF 2
11	PP-02	PLANTING 2 OF 2
12	PP-03	PLANTING DETAILS
13	PP-04	PLANTING SCHEDULE

60% REVIEW SET
FEBRUARY 24, 2017

NO	DATE	BY	APPR	REVISIONS

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TETRA TECH
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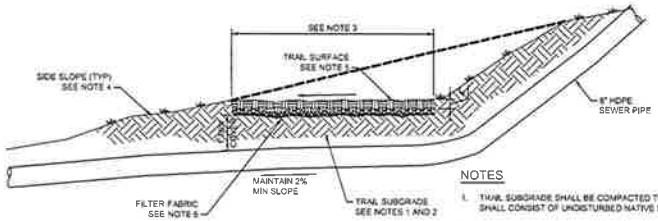
Approved By

E. SCHEY, DESIGN MANAGER, 2/2017
D. GENZLINGER, PROJECT MANAGER, 2/2017

DDG DESIGNED BY 2/2017
RM DRAWN BY 2/2017
MH CHECKED BY 2/2017

City of Bellevue UTILITIES

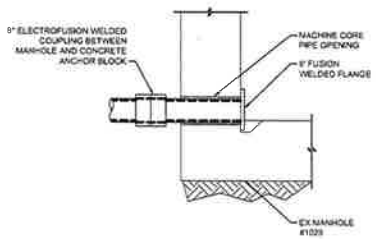
CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
TITLE SHEET, LOCATION MAP, AND DRAWING INDEX
G-01
SHT 1 OF 13



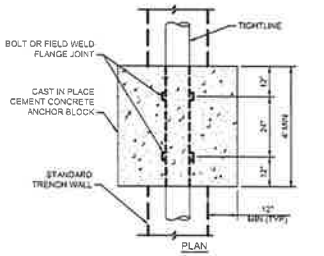
NOTES

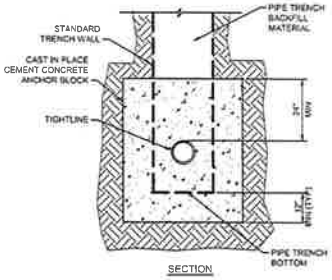
1. TRAIL SUBGRADE SHALL BE COMPACTED TO 95% DENSITY. SUBGRADE SHALL CONSIST OF UNDISTURBED NATIVE SOIL.
2. TRAIL SUBGRADE SHALL BE TREATED WITH APPROVED HERBICIDE PRIOR TO FINAL INSTALLATION OF WOOD CHIP SURFACE.
3. MATCH EXISTING TRAIL WIDTH.
4. TRAIL SIDE SLOPE SHALL BE GRADED WITH TOPSOIL BACKFILL AT A 3:1 SLOPE AND MATCH INTO EX GRADE. GRADING SHALL BE DONE SO THAT ACCUMULATION OF RUN-OFF DOES NOT COLLECT AT BOTTOM OF SLOPE. COMPACT AS REQUIRED.
5. TRAIL CROSS SLOPE SHALL BE MINIMUM 2% OR AS REQUIRED TO MATCH EXISTING. TRAIL SURFACE DEPTH SHALL BE 4" OF MEDIUM BARK CHIPS. FILTER FABRIC SHALL BE INSTALLED BETWEEN WOOD CHIPS AND SUBGRADE AS SPECIFIED BY THE ENGINEER.
6. FILTER FABRIC SHALL BE INSTALLED BETWEEN BASE COURSE AND SUBGRADE AS SPECIFIED BY THE ENGINEER.

1 C-03 TYPICAL WOODCHIP TRAIL
SCALE: 1"= 2'

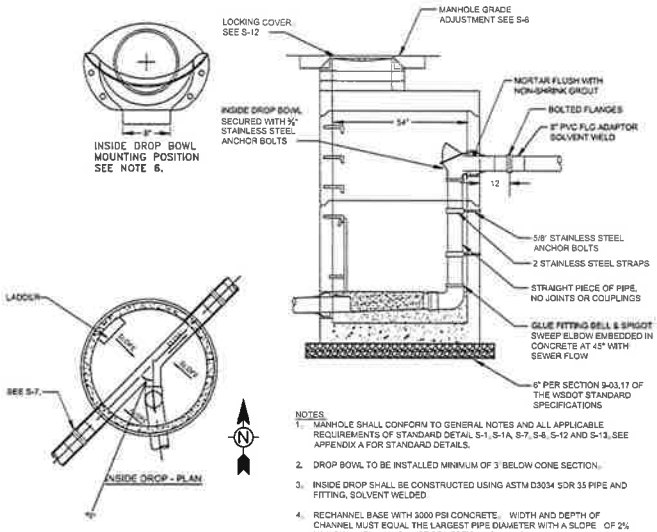


2 C-05 HDPE PIPE CONNECTION - EX MH 14-203509
SCALE: NONE





3 C-03 CONCRETE ANCHOR BLOCK
SCALE: 1"= 2'



NOTES

1. MANHOLE SHALL CONFORM TO GENERAL NOTES AND ALL APPLICABLE REQUIREMENTS OF STANDARD DETAIL S-1, S-1A, S-7, S-8, S-12 AND S-13, SEE APPENDIX A FOR STANDARD DETAILS.
2. DROP BOWL TO BE INSTALLED MINIMUM OF 3' BELOW CONE SECTION.
3. INSIDE DROP SHALL BE CONSTRUCTED USING ASTM D3034 SDR 35 PIPE AND FITTING, SOLVENT WELDED.
4. RECHANNEL BASE WITH 3000 PSI CONCRETE. WIDTH AND DEPTH OF CHANNEL MUST EQUAL THE LARGEST PIPE DIAMETER WITH A SLOPE OF 2% MIN. CHANNEL WALLS MUST BE VERTICAL. SLOPE SHELF TO CHANNEL AT 1" PER FOOT MIN.
5. CORE DRILL OPENINGS FOR NEW PIPE AND USE KOR-N-SEAL CONNECTORS OR EQUAL.
6. INSIDE DROP BOWL SHALL BE 8-8 DROP BOWL WITH HOOD AS MANUFACTURED BY RELINER DURAN, INC.
7. CONE MAY NEED TO BE ROTATED AND/OR LADDER MOVED.

4 C-06 INSIDE DROP STRUCTURE
SCALE: NONE

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL ONLY REMOVE TREES DESIGNATED.
2. CONTRACTOR SHALL NOT USE ANY WHEELED OR TRACK EQUIPMENT IN THE PARK BETWEEN STATION 10+65 TO STATION 21+00. ALL EQUIPMENT USED BY CONTRACTOR SHALL BE PORTABLE AND CAPABLE OF BEING CARRIED IN AND OUT OF THE OPEN SPACE.
3. NO CONSTRUCTION EQUIPMENT OR PERSONAL VEHICLES SHALL BLOCK DRIVEWAYS ALONG 128TH AVE SE.
4. CONTRACTOR SHALL RESTORE ALL DISTURBED SURFACES AS SHOWN ON THE PLANTING PLANS.
5. CONTRACTOR TO PROVIDE STRAW BALES, COIR LOGS AND SILT FENCING TO PROTECT EXCAVATIONS AND PREVENT THE TRANSPORT OF SEDIMENT.

SURVEY NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATES, NORTH ZONE, BASED UPON NAD'83/91.
2. VERTICAL DATUM: NAVD '88.
3. UNITS: UNITED STATES SURVEY FEET.

MONUMENT TABLE				
CONTROL POINT	NORTHING	EASTING	APPROX LOCATION	ELEV
CP 1	-	-	-	-
CP 2	-	-	-	-

4. CONTRACTOR SURVEYOR SHALL STAKE PIPE ALIGNMENT PER AUTOCAD DESIGN ALIGNMENT FILES.
5. CONTRACTOR TO CONFIRM ALIGNMENT WITH CITY ENGINEER PRIOR TO CONSTRUCTION.

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FEBRUARY 24, 2017

NO	DATE	BY	APPR	REVISIONS

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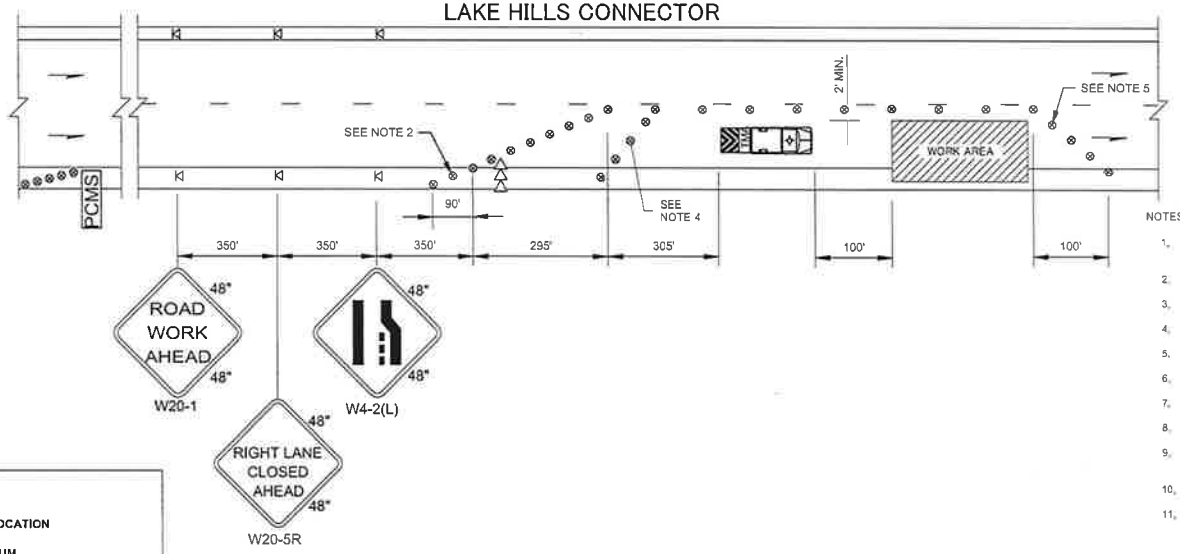
PROJECT MANAGER	DATE	

DDG	2/2017
DESIGNED BY	DATE
RM	2/2017
DRAWN BY	DATE
MH	2/2017
CHECKED BY	DATE

City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
GENERAL NOTES AND DETAILS

C-01 | SHT 2 OF 13



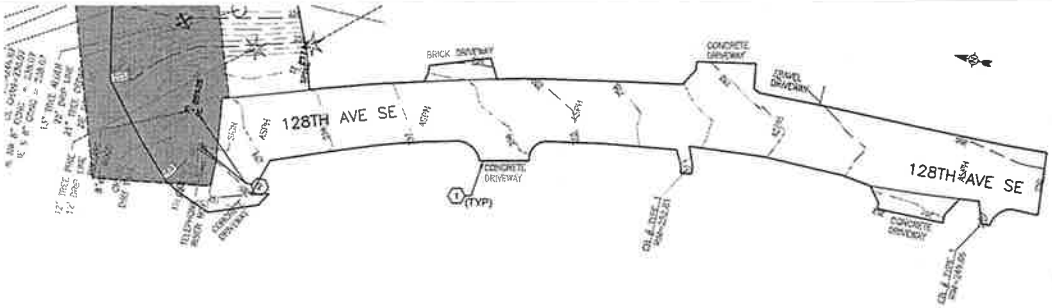
PCMS	
1	2
RIGHT LANE CLOSURE	1 MILE AHEAD

FIELD LOCATE 1 MILE IN ADVANCE OF LANE CLOSURE SIGNING.

NOTES:

1. CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION.
2. EXTEND DEVICE TAPER AT ACROSS SHOULDER.
3. DEVICES SHALL NOT ENCROACH INTO THE ADJACENT LANE.
4. USE TRANSVERSE DEVICES IN CLOSED LANE EVERY 1000' (FT) (RECOMMENDED).
5. DEVICE SPACING FOR THE DOWNSTREAM TAPER SHALL BE 20' (FT).
6. ALL SIGNS ARE BLACK ON ORANGE.
7. THE POSTED SPEED LIMIT ON THE LAKE HILLS CONNECTOR IS 40 MPH.
8. SEE SHEET C-01 FOR WORK AREA LIMITS.
9. HOURS FOR SINGLE LANE CLOSURES SHALL BE LIMITED TO 8:30 AM – 3:30 PM MONDAY THROUGH FRIDAY. ALL OTHER TIMES BOTH LANES SHALL BE OPEN TO TRAFFIC.
10. CONTRACTOR SHALL REMOVE ALL EQUIPMENT FROM THE RIGH-OF-WAY AFTER 3PM.
11. CONTRACTOR SHALL SHUT DOWN BOTH LANES OF TRAFFIC FOR UP TO 10 MINUTES IN LENGTH TO FALL TREES. CONTRACTOR TO SUBMIT ROAD SIGNAGE PLAN AND HAVE FLAGGERS TO CONTROL TRAFFIC.
12. TRANSPORTABLE ATTENUATOR IS REQUIRED.

SINGLE-LANE CLOSURE FOR MULTI-LANE ROADWAYS



NOTES:

1. CONTRACTOR SHALL NOT BLOCK DRIVEWAYS ON 128TH AVE SE TO OFFLOAD PIPE AND EQUIPMENT AND TO ASSEMBLE PIPE.
2. REMOVAL OF SIGNS AND FENCING SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.

60% REVIEW SET
FEBRUARY 24, 2017

NO	DATE	BY	APPR	REVISIONS

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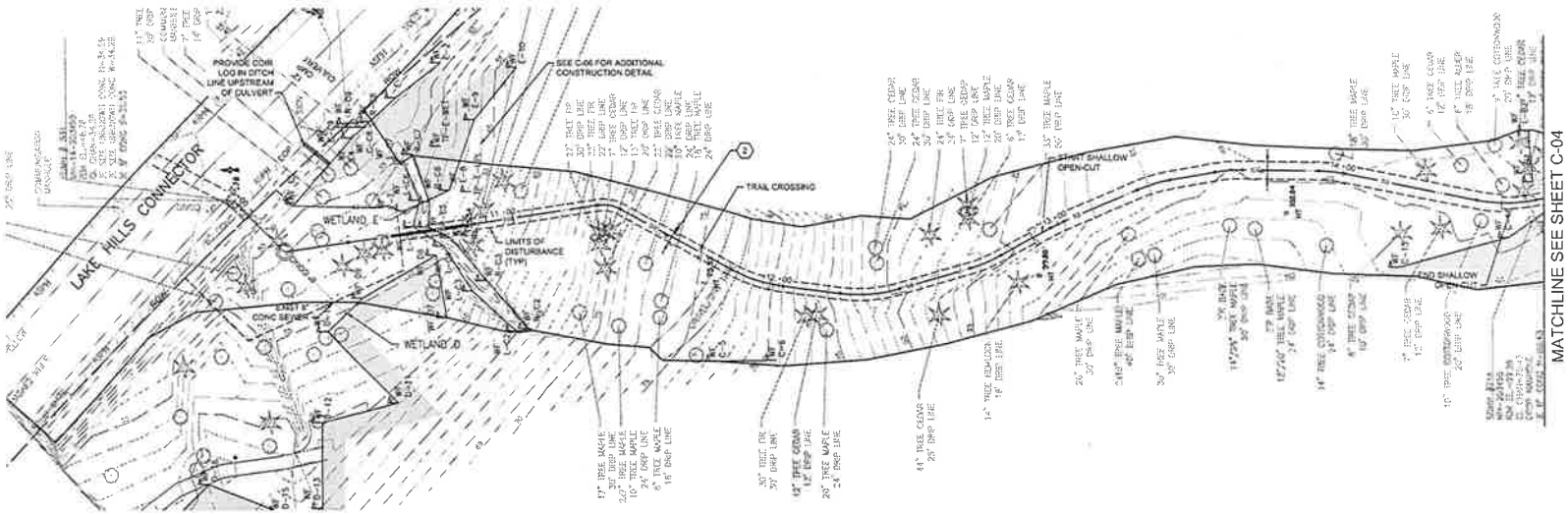
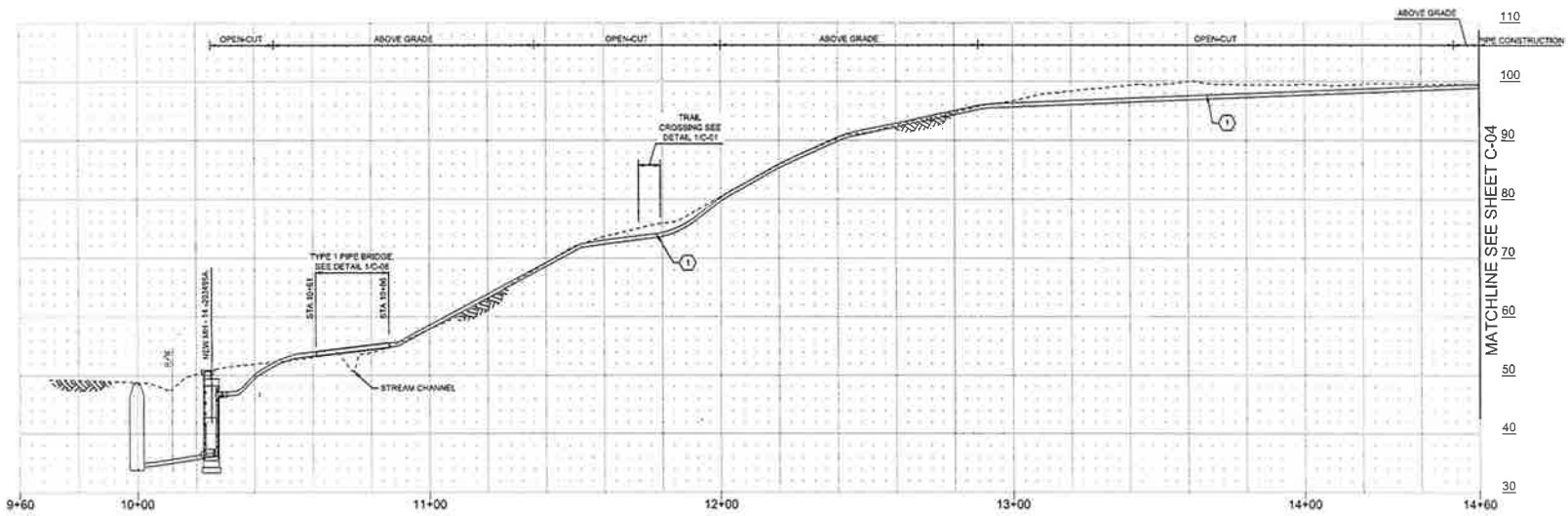
City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
TRAFFIC CONTROL PLAN

C-02 | SHT 3 OF 13



PLAN



LEGEND

WETLAND AREA

WORK LIMITS

NOTES:

1. MAINTAIN 2% MINIMUM GRADE.
2. MAXIMUM DISTURBANCE WIDTH ALONG THE ABOVE GRADE PORTION OF THE PIPELINE ALIGNMENT SHALL BE 4 FEET WIDE AND THE MAXIMUM DISTURBANCE WIDTH ALONG THE HAND-DUG OPEN CUT PORTION OF THE PIPELINE ALIGNMENT (STATION 12+90 TO STATION 14+55) SHALL BE 6 FEET WIDE.

SCALE: 1" = 20'

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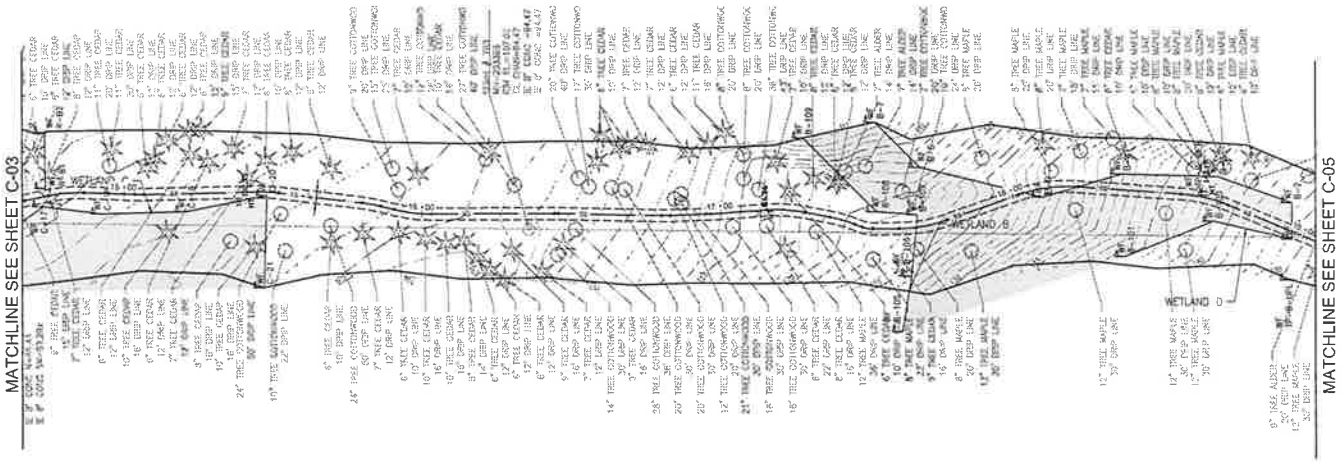
		MH 2/2017
		CHECKED BY DATE

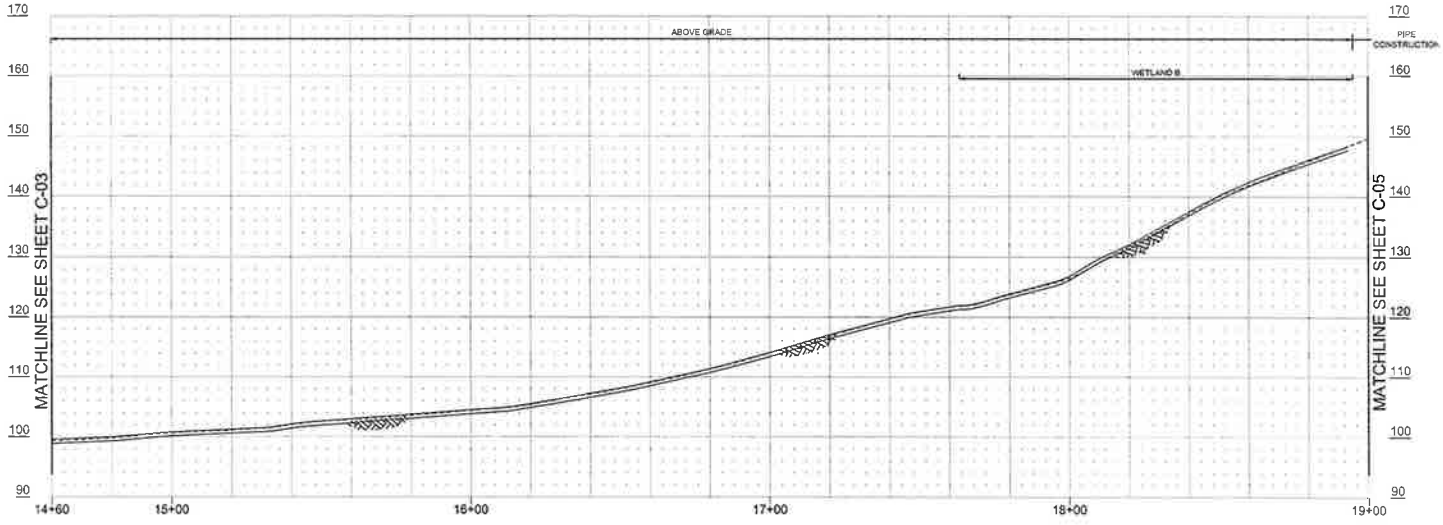
City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLAN AND PROFILE
STA 10+16 TO STA 14+60

C-03 | SHT 4 OF 13



PLAN



LEGEND

WETLAND AREA

WORK LIMITS

SCALE: 1" = 20'

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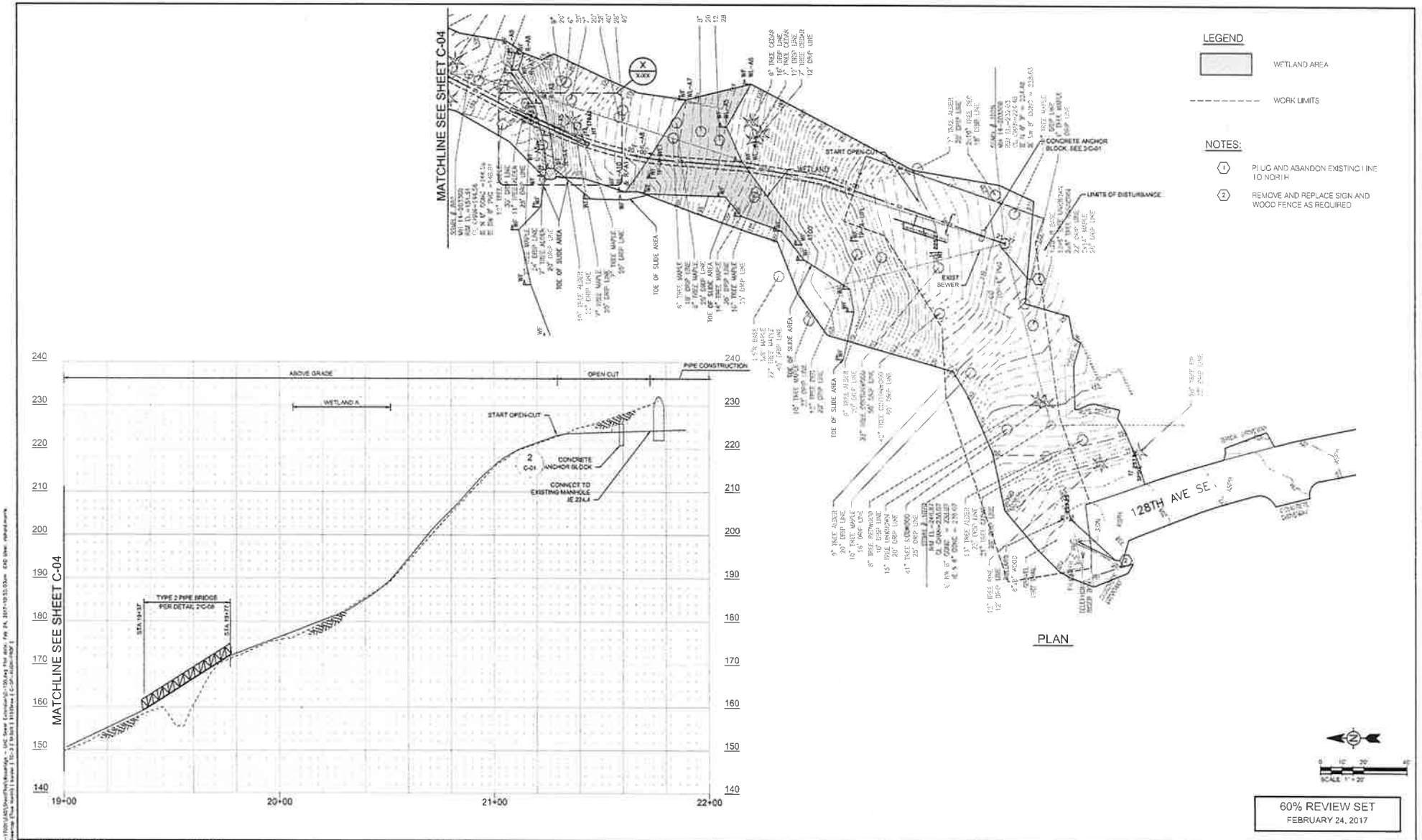
City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLAN AND PROFILE
STA 14+60 TO STA 19+00

C-04 | SHT 5 OF 13



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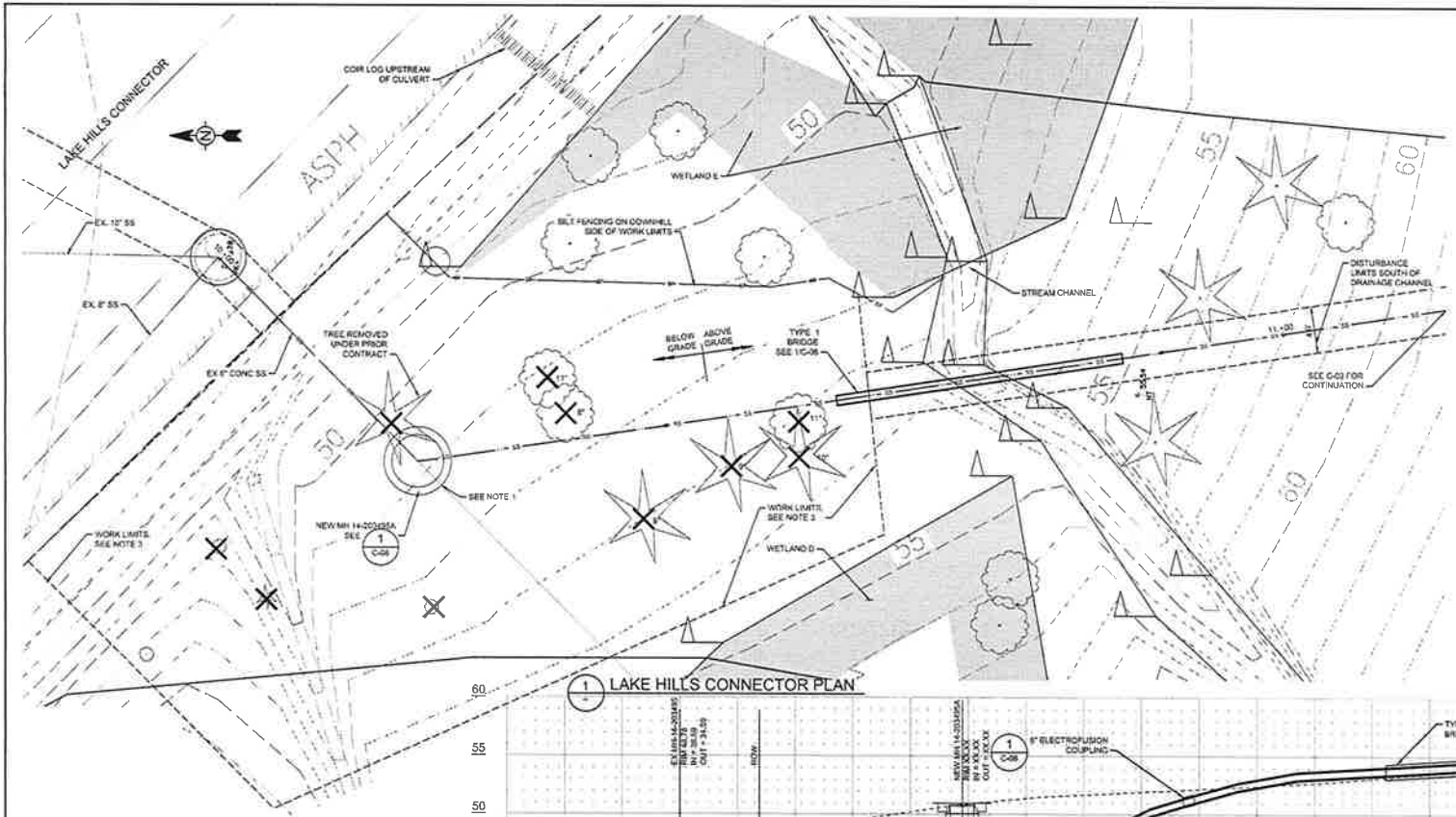
City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLAN AND PROFILE
STA 19+00 TO STA 21+76

C-05 | SHT 6 OF 13



LEGEND

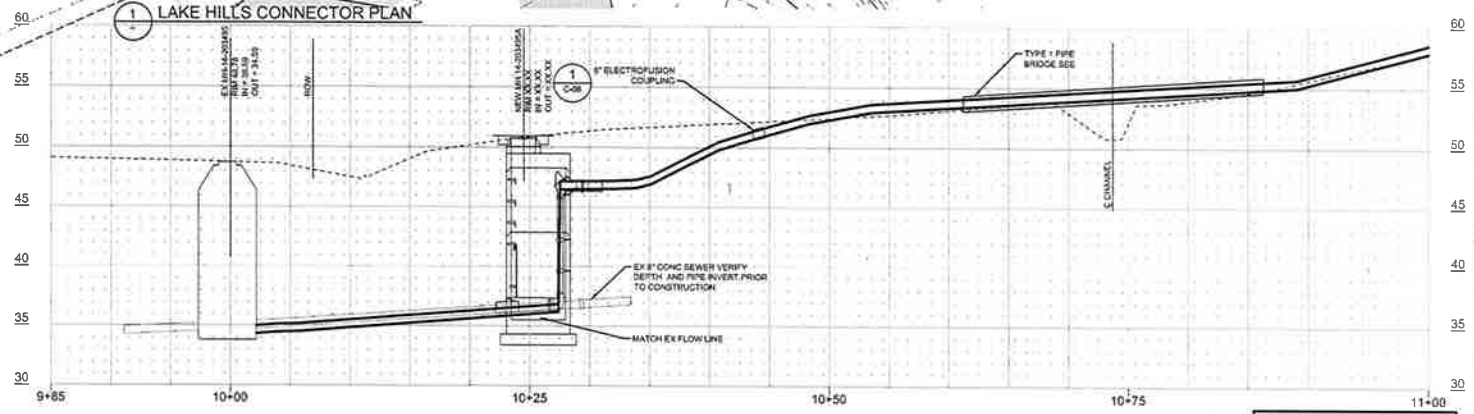
- TREE REMOVAL
- CEDAR
- COTTONWOOD
- WETLAND AREA
- WORK LIMITS
- SF — SILT FENCE

NOTES

1. ONCE PIPELINE IS ACCEPTED FOR SERVICE, PLUG EXISTING 8-INCH SEWER SOUTH AND RECHANNEL MANHOLE.
2. SEE C-02 FOR TRAFFIC CONTROL REQUIREMENTS.
3. CONTRACTOR SHALL CONFINE ITS WORK TO THE WORK LIMITS SHOWN. INSTALL ORANGE PLASTIC FENCING TO DEFINE LIMITS OF WORK.

SCALE: 1" = 5'

1 LAKE HILLS CONNECTOR PLAN



2 LAKE HILLS CONNECTOR PROFILE

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City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
CONSTRUCTION AREA NEXT TO LAKE HILLS CONNECTOR

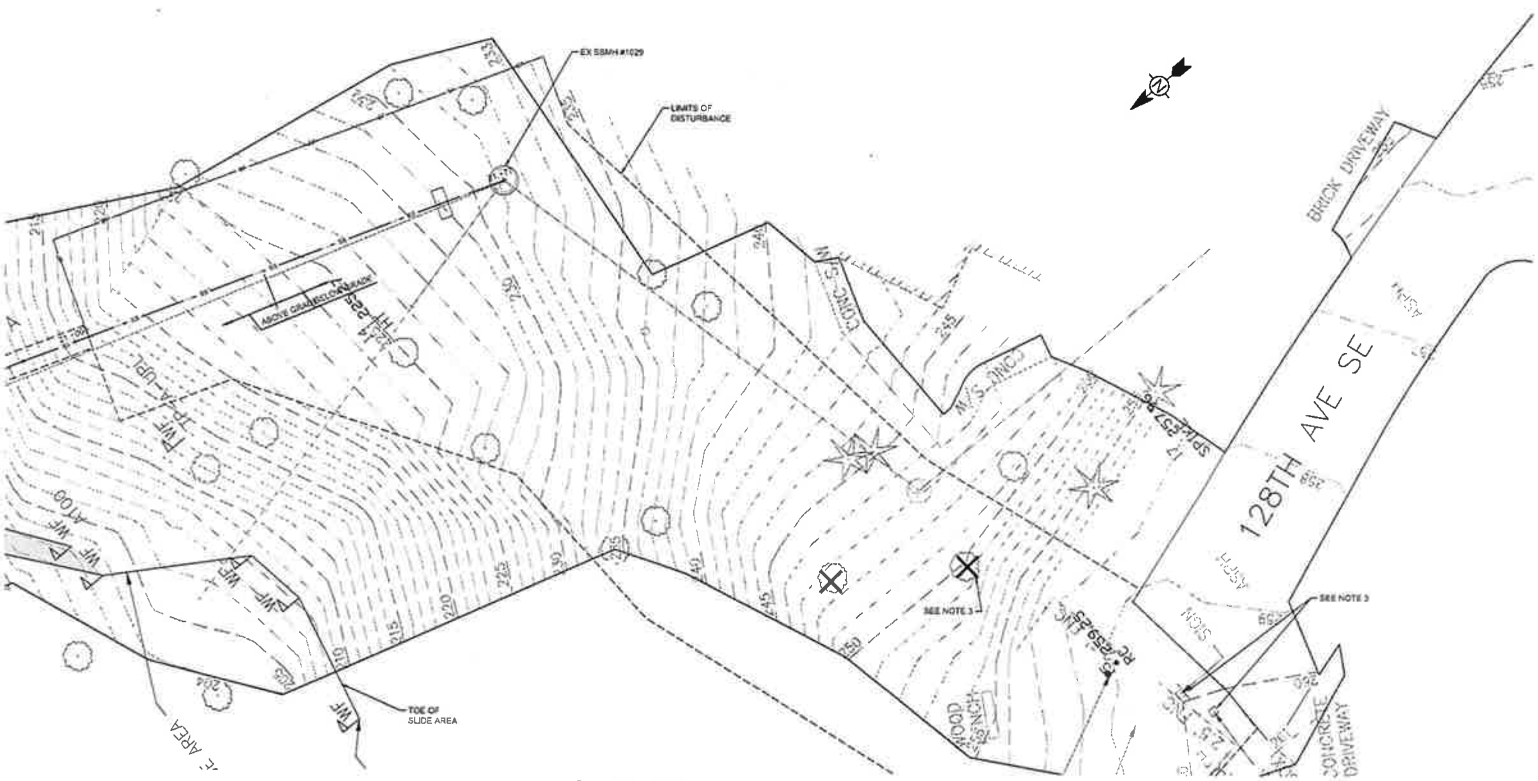
C-06 | SHT 7 OF 13

LEGEND

X	TREE REMOVAL
○	CEDAR
✳	COTTONWOOD
▭	WETLAND AREA
- - - - - - - -	WORK LIMITS
— SF —	SILT FENCE

NOTES

1. ONCE PIPELINE IS ACCEPTED FOR SERVICE, PLUG EXISTING 8-INCH SEWER SOUTH AND RECHANNEL MANHOLE.
2. LIMIT TREE REMOVAL AS MUCH AS POSSIBLE WITHIN DISTURBANCE LIMITS. SEE PLANTING PLANS.
3. REMOVE AND REPLACE TRAIL SIGN AND FENCING TO ORIGINAL CONDITION.



1 SITE PLAN

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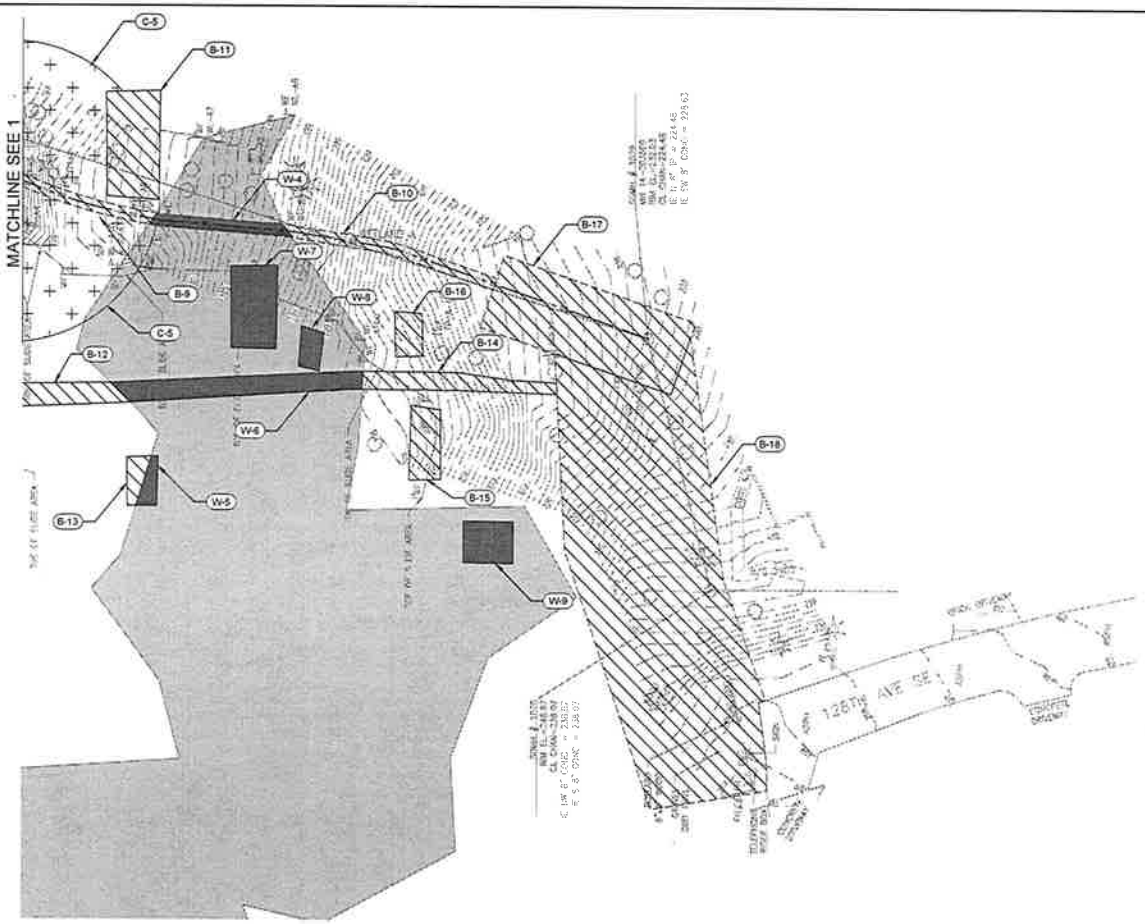
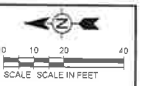
RM — DRAWN BY	2/2017 DATE
MH — CHECKED BY	2/2017 DATE

City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
CONSTRUCTION AREA NEXT TO 128TH AVE SE

C-07 SHT 8 OF 13





LEGEND:

- EXISTING MAJOR CONTOUR (5FT)
- EXISTING MINOR CONTOUR (1FT)
- NEW 8" DIA HDPE SS PIPE
- DISTURBANCE LIMITS
- EXISTING TREES
- WETLAND
- WETLAND PLANTING ZONE
- BUFFER PLANTING ZONE
- CONIFER PLANTING ZONE
- B-18 PLANT ZONE

NO	DATE	BY	APPR	REVISIONS

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HERRERA

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PROJECT MANAGER DATE

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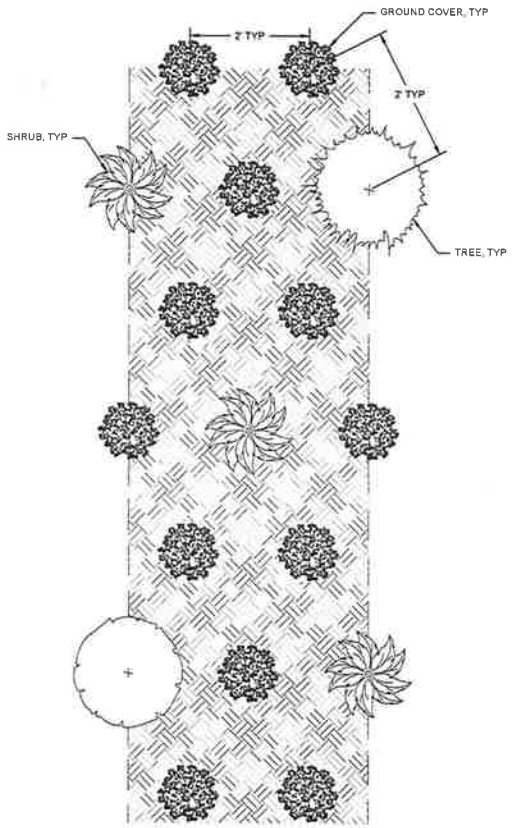
City of Bellevue
UTILITIES

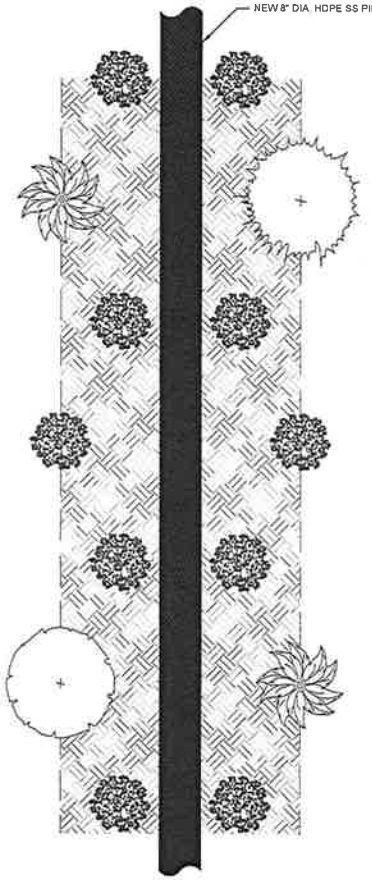
CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLANTING 2 OF 2

SHT 2 OF 4



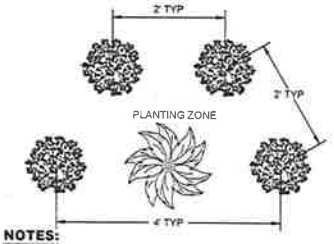
DETAIL - TYPICAL PLANT SPACING IN BURIED PIPE AREA (1)

SCALE: NTS



DETAIL - TYPICAL PLANT SPACING IN ABOVE GROUND PIPE AREA (2)

SCALE: NTS

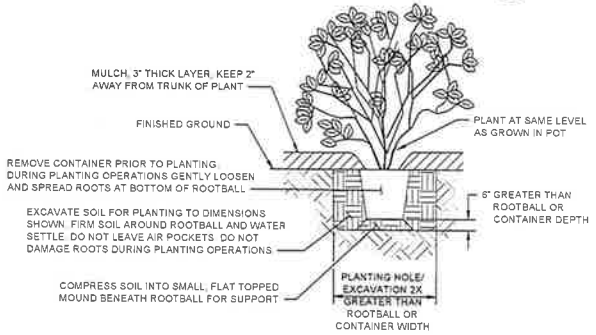


NOTES:

1. PLANT EACH SPECIES IN CLUSTERS OF THREE, FIVE OR SEVEN.
2. EVENLY SPACE CLUSTERS THROUGHOUT PLANTING AREA.

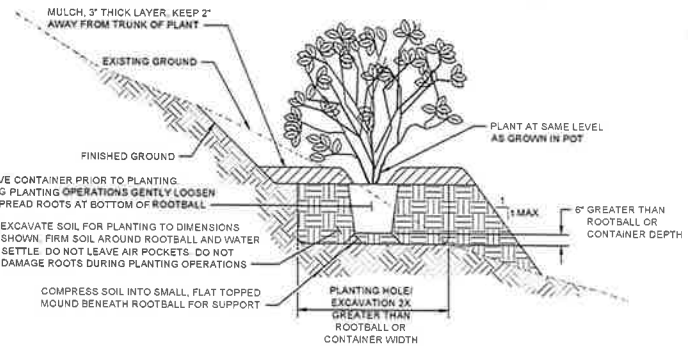
DETAIL - PLANT SPACING (3)

SCALE: NTS



DETAIL - ONE GALLON CONTAINER TREE AND SHRUB PLANTING (4)

SCALE: NTS



DETAIL - ONE GALLON CONTAINER TREE AND SHRUB PLANTING ON SLOPE (5)

SCALE: NTS

NO	DATE	BY	APPR	REVISIONS

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City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLANTING DETAILS

SHT 3 OF 4

					Wetland Planting Zones									Buffer Planting Zones																	Conifer Planting Zones				
Scientific Name	Common Name	Stock Type	O.C. Spacing (feet)	Total Quantity	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	B-14	B-15	B-16	B-17	B-18	C-1	C-2	C-3	C-4	C-5
Trees				0																																
Psuedotsuga menziesii	Douglas fir	1 gal.	12	36																												3	17	3	6	7
Thuja plicata	Western red cedar	1 gal.	8	179	1	3	5	3	1	9	7	2	4	9	4	2	15	5	4		2	2	2	6	9	1	3	2	1	15	62					
Thuja plicata	Western red cedar	1 gal.	12	36																												2	17	4	6	7
Tsuga heterophylla	Western hemlock	1 gal.	8	145										9	3	2	16	5	4	1	2	1	3	5	10	1	3	2	1	15	62					
Tsuga heterophylla	Western hemlock	1 gal.	12	36																												2	17	4	7	6
Shrubs				0																																
Cornus sericea	Red-osier dogwood	1 gal.	4	16	2		7				7																									
Lonicera involucrata	Black twinberry	1 gal.	4	17				5		7			5																							
Oemleria cerasiformis	Indian plum	1 gal.	4	146										13	7	5	17	10						9	11			5		14	55					
Physocarpus capitatus	Pacific ninebark	1 gal.	4	14			9				5																									
Ribes lacustre	Black gooseberry	1 gal.	4	18					4	7			7																							
Ribes sanguineum	Red flowering currant	1 gal.	4	107													5	7					8	9			9			14	55					
Rosa pisocarpa	Swamp rose	1 gal.	4	21		4				7	5	5																							
Rosa gymnocarpa	Bald hip rose	1 gal.	4	146										14		7	17	7	7			5			11	5		4		14	55					
Rubus spectabilis	Salmonberry	1 gal.	4	203		4		5		7	5			13	8		17		7		7		7	9	11		9	4		14	76					
Sambucus racemosa	Red elderberry	1 gal.	4	107													19	7							12					14	55					
Symphoricarpos albus	Snowberry	1 gal.	4	183										13	7		19		9	4	5	5		7	11				7	21	75					
Groundcover				0																																
Athyrium filix-femina	Lady fern	1 gal.	2	437	7	33	65	40	17	113	91	21	50																							
Polystichum munitum	Sword fern	1 gal.	2	3458										215	89	48	380	65	91	15	46	42	62	137	228	20	74	53	29	368	1496					

NO	DATE	BY	APPR	REVISIONS

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Approved By

DESIGN MANAGER DATE

PROJECT MANAGER DATE

DESIGNED BY DATE

DRAWN BY DATE

CHECKED BY DATE

City of Bellevue
UTILITIES

CITY OF BELLEVUE
WOODRIDGE OPEN SPACE SEWER REPLACEMENT
PLANTING SCHEDULE

SHT 4 OF 4

CRITICAL AREAS REPORT AND MITIGATION PLAN

WOODRIDGE OPEN SPACE SEWER REPLACEMENT BELLEVUE, WASHINGTON

Prepared for City of Bellevue Utilities Department

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA

Note:
Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

CRITICAL AREAS REPORT AND MITIGATION PLAN

WOODRIDGE OPEN SPACE SEWER REPLACEMENT BELLEVUE, WASHINGTON

Prepared for
City of Bellevue Utilities Department
450 110th Avenue Northeast
Bellevue, Washington 98004

Prepared by
Herrera Environmental Consultants, Inc.
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Seattle, Washington 98121
Telephone: 206-441-9080

Revision 1
March 21, 2017

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DISCLAIMER

Herrera Environmental Consultants, Inc. (Herrera) has prepared this report for use by the City of Bellevue. The results and conclusions in this report represent the professional opinion of Herrera Environmental Consultants, Inc. They are based upon examination of public domain information concerning the study area, site reconnaissance, and data analysis.

Various agencies of the State of Washington and the City of Bellevue may require a review of final site development plans that could potentially affect zoning, buffer requirements, water quality, or habitat functions of lands in question; therefore, the findings and conclusions in this report should be reviewed by appropriate regulatory agencies before any detailed site planning or construction activities.

RESPONSIBLE PARTIES

The City of Bellevue Utilities Department is the project proponent, applicant, and lead agency for the Woodridge Open Space Sewer Replacement project. The City is responsible for implementation, monitoring, long-term maintenance, and contingency plans.

Applicant:
Birol Shaha, PE
City of Bellevue Utilities Department
450 110th Avenue NE
Bellevue, WA 98004
425-452-4477

HERRERA QUALIFICATIONS

Established in 1980, Herrera is an innovative, employee-owned, consulting firm focused on three practice areas: water, restoration, and sustainable development. Herrera's interdisciplinary teams of scientists, engineers, and planners provide scientifically defensible and realistic solutions to complex resource challenges facing municipalities, utilities, government agencies, tribes, nonprofits, and businesses. Herrera's philosophy is to integrate protection of environmental, cultural, and economic values into all our projects.

The following staff authored this report and conducted field work in support of this report. A summary of their qualifications is provided.

Kris Lepine, PWS

Kris Lepine is a project manager and ecologist with 17 years of professional experience in wetland assessment, wildlife biology, fisheries biology, restoration and mitigation, wetland mitigation banking, environmental permitting, construction management, and monitoring. He performs a variety of environmental studies for private and public development projects, which include wetland delineations, wildlife and habitat assessments, stream surveys, and mitigation plans. He has managed and participated in design of many wetland and stream restoration/ mitigation projects including preparation of plans, specifications, and costs estimates related to habitat structure, grading, soil preparation, and revegetation. In addition, he coordinates a wide range of local, state, and federal environmental permits and approvals on projects including Clean Water Act (CWA) Section 404 permits, CWA Section 401 Water Quality Certifications, Hydraulic Project Approvals, storm water permits, Tribal approvals, shoreline permits, and consistency with local government critical areas codes. He has extensive experience preparing various permit applications and compiling necessary supporting documentation.

Credentials

- BS, Environmental Science, Huxley College at Western Washington University, 1997
- Certificate in Wetland Science and Management, University of Washington, 1999
- Certified Professional Wetland Scientist (PWS) #1514, Society of Wetland Scientists, 2005

Shelby Petro, WPIT

Shelby Petro is a wetland scientist and environmental permit coordinator with 8 years of experience in environmental consulting, specializing in natural resources management, wetland science, and regulatory compliance for public and private projects. Shelby conducts biological resources surveys for special-status plant and wildlife species; performs wetland delineations and critical areas assessments; prepares technical reports and documentation for National and

State Environmental Policy Act (NEPA and SEPA) compliance; and prepares mitigation plans for impacts to wetlands and streams. Shelby coordinates with local, state, and federal agencies, completes applications, and obtains permits and approvals for project compliance with regulations including Critical Area Ordinances, Shoreline Management Act, State Hydraulic Code, SEPA, NEPA, Endangered Species Act (ESA), and Clean Water Act (CWA) Sections 401 and 404.

Credentials

- BS, Biology, Indiana Wesleyan University, 2007
- MESM, Master of Environmental Science and Management, University of California, Santa Barbara, 2014
- Certificate in Wetland Science and Management, University of Washington, 2015
- WPIT, Wetland Professional in Training, Society of Wetland Scientists, 2015
- Certified Biological Assessment Junior Author, WSDOT, 2015–present

Julia Munger, WPIT

Julia Munger is a natural resources scientist with 8 years of experience in stream, wetland, and forest restoration; integrated pest management; wildlife surveys and habitat assessment; and parks maintenance and construction. Julia has extensive experience in habitat restoration, including the planning, implementation, monitoring and maintenance of restoration and mitigation sites. She has delineated wetlands in Washington, Alaska, Oregon, and Montana. She has worked in Washington and California to identify, map, and eradicate invasive plant species. Julia conducts vegetation monitoring of mitigation and restoration sites; wetland and stream delineations; and provides recommendations and technical reports to support permit compliance and performance standards.

Credentials

- BS, Environmental Science, Western Washington University, 2008
- Certificate in Wetland Science and Management, University of Washington, 2013
- WPIT, Wetland Professional in Training, Society of Wetland Scientists, 2014
- ISA Certified Arborist, International Society of Arboriculture, PN-7903A

EXECUTIVE SUMMARY

Herrera Environmental Consultants, Inc. (Herrera) prepared this report for the proposed Woodridge Open Space Sewer Replacement project (hereafter referred to as the project) with the purpose of identifying critical areas and mitigating unavoidable impacts to those areas. This report was prepared in support of a Critical Areas Land Use Permit from the City of Bellevue Development Services Department and a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW).

The City of Bellevue Utilities Department (hereafter referred to as the City) proposes to replace an existing sewer pipeline with a new 1,275-foot-long, 8-inch-diameter high-density polyethylene (HDPE) pipeline. The proposed sewer pipeline will traverse a hillside within the Woodridge Open Space, which is owned by the City of Bellevue and managed by the City of Bellevue Parks and Community Services Department. The existing sewer pipeline has exceeded its design life and is deteriorated. As a result, the City recently repaired a leaking section of pipe and there is potential for other leaks along the pipeline. This pipeline replacement is part of the City's ongoing sewer system renewal and replacement program.

The replacement pipeline will be constructed primarily on the ground surface. The flexible HDPE pipe will meander as it traverses the hillside, thereby minimizing tree removal to one significant tree (between staging areas). Removal of this tree is necessary to avoid impact to an adjacent wetland and stream. The alignment was selected based on several factors including topography that supports gravity flow and avoidance and minimization of stream and wetland impacts. Portions of the pipeline will be buried to connect to manholes at the upstream and downstream extents, to cross under an existing trail, and to facilitate gravity flow. Vegetation and land disturbance along the pipeline alignment (between staging areas) will be restricted to a 4-foot width for aboveground portions of pipe and a 6-foot width for buried portions of pipe. Within these zones, vegetation and downed wood will be removed as necessary to facilitate pipeline installation. Because heavy equipment will not be necessary for the most part, removal of vegetation and soil disturbance will be minimal. A buried concrete block will be installed around the new pipeline near the existing uphill manhole (south end of project) to anchor the pipe in place. A new manhole will be installed at the downhill (north) extent of the project, which will intercept the existing sewer pipeline and connect to the new pipeline. The replacement pipeline will span over two streams. Above ground portions of the existing pipeline will be removed once the new pipeline is installed. Below ground portions will be abandoned in place after they are flushed with water to eliminate residual sewage.

At the south end of the project, the 128th Avenue Southeast roadway will be used to stage construction equipment and materials; however, an additional temporary construction staging area will be cleared within the open space to provide access to the existing manhole. At the north end of the project, staging is prohibited on the Lake Hills Connector. Therefore, a small

temporary construction staging area will be cleared adjacent to the Lake Hills Connector to support installation of the new manhole, pipeline, and a pipe bridge over a stream. Where this staging area crosses a stream, steel plates will be used to prevent disturbance to the channel and banks. Upwards of 20 significant trees (greater than 8 inches measured at diameter breast height [dbh]) will need to be removed from these staging and access areas, and an additional nine trees between 4 and 8 inches dbh will be removed in the northern staging area. The contractor will only clear trees within these areas that are necessary to construct the project. To support habitat functions, felled trees will remain within wetlands and buffers as downed wood and will be installed within the channel of a Type F stream.

Herrera biologists conducted site visits on October 27 and 31, 2016, to delineate wetlands and the ordinary high water marks (OHWMs) of streams within the study area. The study area contains regulated critical areas including wetlands, streams, and their associated buffers (Table ES-1). The site also contains geologic hazard areas and habitat associated with species of local importance, specifically habitat used by pileated woodpecker (*Dryocopus pileatus*).

Table ES-1. Wetlands and Streams Delineated in the Study Area for the Woodridge Open Space Sewer Replacement Project.

Wetland or Stream Name	Size (square feet)	USFWS Classification[a]	HGM Classification[b]	Wetland Category/ Stream Type[c]	Standard Buffer Width (feet)[d]
Wetland A	38,507	PFO, PSS	Slope	III	110
Wetland B	97,567[e]	PFO, PSS	Slope	III	110
Wetland C	70,070[e]	PFO, PSS	Slope	III	110
Wetland D	50,526[e]	PFO, PSS	Slope	III	110
Wetland E	1,465	PFO, PSS	Slope	IV	40
Richards Creek	–	–	–	F	100
Stream 1	–	–	–	N	50
Stream 2	–	–	–	N	50
Stream 3	–	–	–	N and F	50–100
Stream 4	–	–	–	N	50

[a] US Fish and Wildlife Service classification is based on Cowardin et al. (1979): palustrine forest (PFO) and palustrine scrub-shrub (PSS).

[b] Hydrogeomorphic classification is based on Brinson (1993).

[c] City wetland category is based on the Washington State Department of Ecology wetland rating system (Hruby 2004) and Bellevue Land Use Code (LUC) 20.25H.095.B. City stream type determined according to LUC 20.25H.075.B.

[d] Wetland buffer determined according to LUC 20.25H.095.C. Stream buffer determined according to LUC 20.25H.075.C.

[e] Estimated wetland size.

Geologic hazard areas are addressed in a separate report prepared by Shannon and Wilson (2017) that is included in Appendix A of this report. The project area qualifies as a geologically critical area for two reasons:

- It is a landslide hazard because many parts of the slope are steeper than 15 percent and contain areas of historical failures, have shown movement in the Holocene, exhibit hummocky ground, contain seeps, and have localized incised stream erosion.

- The hillside also contains many disconnected slopes steeper than 40 percent that are higher than 10 feet and exceed 1,000 square feet.

The project has been designed to avoid geologic hazards to the extent possible. To avoid hazard, the pipeline alignment was routed around an actively moving slope associated with a historical landslide. The project will avoid most, but not all, of the steep slopes. Based on geotechnical recommendations the pipeline will be installed primarily on the ground surface for the following reasons:

- If buried at a shallow depth, the proposed pipeline would be very slowly displaced along with thick colluvium on the hillside as the soil creeps eastward downhill.

- If buried deeply, it is doubtful that the pipeline could be founded in competent soil because previous explorations indicated that the colluvium is as thick as 40 feet in some locations. That depth of excavation would not be feasible for this project.

- Excavations for a buried pipe and temporary construction roads would significantly disturb soils and vegetation within the Woodridge Open Space.

The project has made all reasonable efforts to avoid, minimize, rectify, reduce, and compensate for impacts on critical areas and buffers in a manner that maintains ecological functions of wetlands, streams, and buffers. During the design process, project engineers and biologists coordinated to select a sewer pipeline alignment that largely avoids permanent impacts on wetlands by constructing the pipeline mainly in buffer areas. Similarly, the pipeline alignment was selected to avoid impact to Stream 2. Where crossing streams is unavoidable, the project team considered several crossing options and ultimately chose a pipe bridge option that will be used for crossing Streams 1 and 3 (Tetra Tech 2016b, Appendix F). While these crossings will still represent a permanent stream impact, the selected design option avoids direct impact to stream banks and channel substrate (i.e., area waterward of OHWMs). The pipe bridge footings will be located landward of the OHWM. In addition, the pipe bridge option minimizes impact to stream buffers when compared to open cut and boring options, which would have resulted in large areas of vegetation clearing (trees, shrubs, and groundcover) on each side of the streams. In addition, by minimizing vegetation clearing, adverse effects on pileated woodpecker habitat will be minimized.

Complete avoidance of permanent impacts to wetlands, streams, and buffers is not feasible. Permanent impacts are unavoidable within the footprint of the pipeline, new manhole, and aerial bridge crossings. In select places, it is necessary to intrude within or cross wetlands with the pipeline alignment when weighing several factors including topography, the need to maintain gravity flow, limitations in pipe flexibility to navigate around wetlands, and desire to preserve significant trees that are high-quality wildlife habitat. Where intrusion into wetlands is necessary,

careful consideration was given to minimizing impact to the outer edges of wetlands or by crossing relatively narrow portions of the wetlands. The avoidance of buffer impacts is not feasible because wetland and stream buffer widths cover most of the upland areas within the study area.

The project will unavoidably intrude into wetlands, streams, and buffers, resulting in temporary and permanent impacts (Table ES-2). The footprint of the pipeline, manhole, pipe bridges over Streams 1 and 3, and bridge footings used to support the pipeline will result in permanent wetland, stream, and buffer impacts. Temporary wetland and buffer impacts will result from vegetation clearing and ground disturbance (i.e., minor excavation and grading) along the pipeline alignment disturbance zones and within construction staging areas.

Table ES-2. Summary of Impacts for the Woodridge Open Space Sewer Replacement Project.

Project Element	Temporary Wetland Impact (square feet)	Temporary Buffer Impact (square feet)	Temporary Stream Impact (square feet)	Permanent Wetland Impact (square feet)	Permanent Stream Impact (square feet)	Permanent Buffer Impact (square feet)
Aerial Crossings at Streams	–	–	–	–	12	–
Pipeline	–	–	–	110	–	663
Pipeline Construction Corridor	553	3,832	–	–	–	–
Staging Areas	–	10,253	145	–	–	–
Total	**553**	**14,085**	**145**	**110**	**12**	**663**

After the pipeline is replaced, temporary impacts along the construction corridor including staging areas will be restored with native vegetation involving planting of trees, shrubs, and groundcover. Restoration will include 553 square feet of wetland and 14,085 square feet of buffer that was temporarily impacted during construction at a 1:1 ratio.

The project will provide compensatory mitigation for permanent impacts by providing additional enhancement of wetlands and buffers along the project corridor: 1,350 square feet of wetlands will be enhanced at a 12:1 ratio and 3,199 square feet of buffer will be enhanced at a 4:1 ratio. To mitigate for permanent stream impact, 13,619 square feet of stream buffer will be enhanced by planting native conifer trees within a 50-foot radius of each stream crossing location.

To provide additional mitigation, a portion of the trees that are removed during construction will be placed within the channel of Stream 3. Logs will be placed with limbs attached and will crisscross each other within the channel, positioned parallel to the stream channel alignment. The mitigation measures ensure there will be no net loss of functions associated with the replacement of the pipeline. The wetlands and buffers will be planted with a variety of native plants, which will increase the plant diversity of the site. In addition, the planting of conifer tree

species, over time, will enhance habitat for pileated woodpeckers and other terrestrial wildlife species.

Overall, a total area of 33,061 square feet will be planted with native vegetation within the Woodridge Open Space. Trees greater than 4 inches dbh that are removed during construction will be replaced at a 15:1 ratio. Planted vegetation will be monitored annually for 5 years to ensure compliance with mitigation goals and vegetation performance standards. In addition, annual monitoring will be conducted for 5 years to determine if channel erosion has exposed portions of the abandoned sewer pipeline where it crosses beneath stream channels. The City will conduct annual maintenance in support of achieving performance standards for vegetation and the abandoned sewer pipeline.

INTRODUCTION

This critical area report and mitigation plan was prepared for the Woodridge Open Space Sewer Replacement project (hereafter referred to as the project) in compliance with Bellevue Land Use Code (LUC) 20.25H. This report describes the conditions of critical areas, including wetlands, streams, and habitat associated with species of local importance, as well as critical area ratings and required buffer widths. It also identifies applicable federal, state, and local laws and regulations. The only other critical areas that occur onsite, geologic hazard areas, are addressed in a separate report prepared by Shannon and Wilson (2017) (Appendix A). Geologic hazard areas within the study area include a landslide hazard area and steep slopes. This report was prepared in support of a Critical Areas Land Use Permit from the City of Bellevue Development Services Department and a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW).

The City of Bellevue Utilities Department (hereafter referred to as the City) proposes to replace an aging sewer pipeline with approximately 1,275 feet of 8-inch-diameter high-density polyethylene (HDPE) pipe. The existing and replacement pipelines traverse a hillside within the Woodridge Open Space, which is managed by the City of Bellevue Parks and Community Services Department. The existing sewer pipeline has exceeded its design life and is deteriorated. As a result, the City recently repaired a leaking section of pipe and there is potential for other leaks along the pipeline. The replacement pipeline will be constructed primarily on the existing ground surface. Portions of the pipeline will be buried to connect to manholes at the upstream and downstream extents, to cross under an existing trail, and to facilitate gravity flow. The replacement pipeline will span over two streams. Above ground portions of the existing pipeline will be removed once the new pipeline is installed. Below ground portions will be abandoned in place. This pipeline replacement project is part of the City's ongoing sewer system renewal and replacement program.

PROJECT SETTING

The project is located within the Woodridge Open Space in the city of Bellevue, Washington (Figure 1), in Section 4 of Township 24 North, Range 5 East of the Willamette Meridian. Throughout this report, the *project area* refers to the areas where construction impacts and staging will occur. The *study area* includes the project area, as well as a 300-foot buffer surrounding the project area. The study area occurs within Water Resource Inventory Area (WRIA) 8 (Cedar-Sammamish) within the Lake Washington watershed and Richards Creek subbasin.

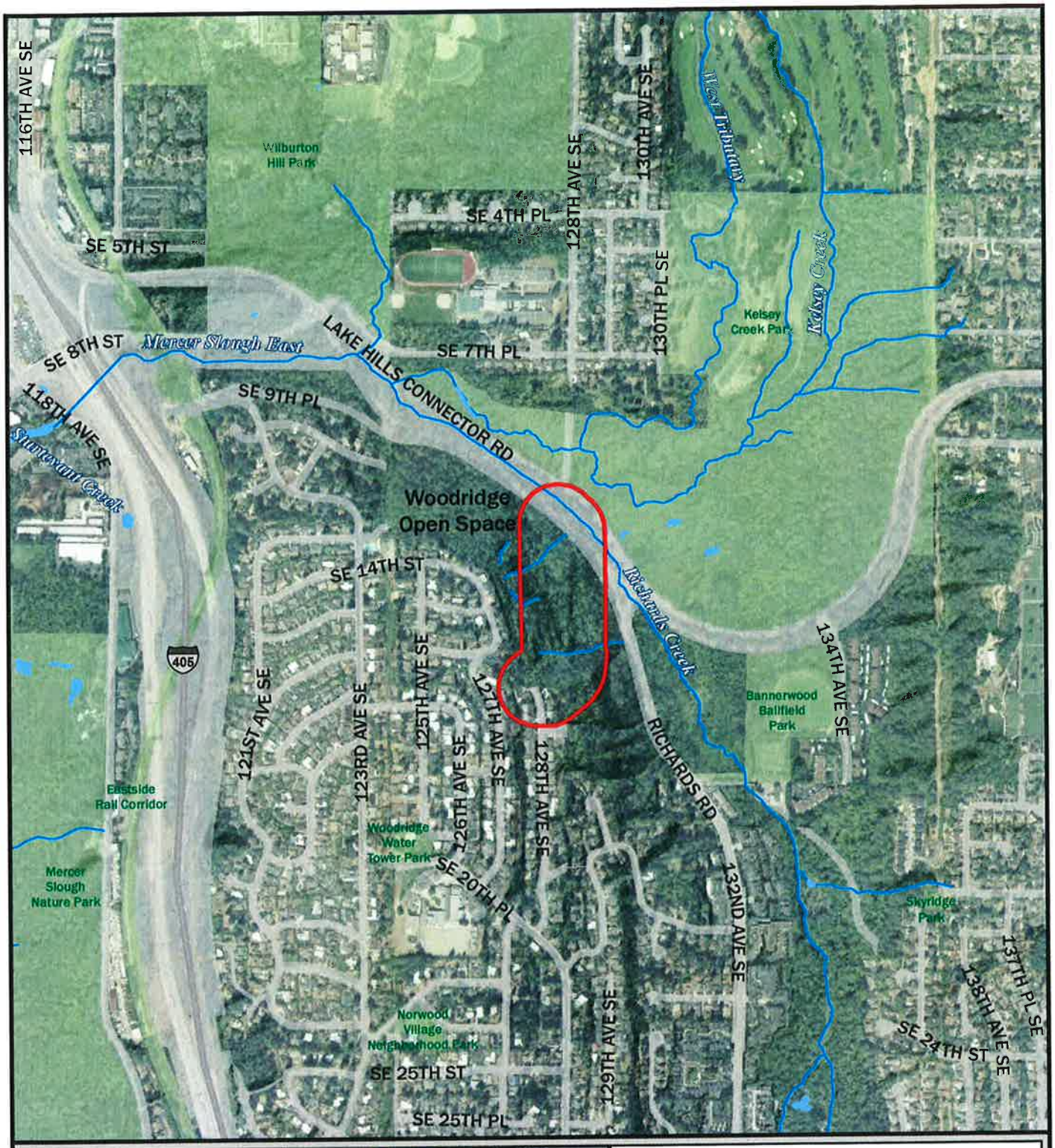


Figure 1.
Vicinity Map for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

Land use in the surrounding vicinity is a mix of residential and open space park properties. Single family residences surround the study area on the west and south sides of the study area, while Lake Hills Connector and Richards Road border the north and east sides of the study area (Figure 1). The study area is on a City-owned parcel that consists of dense vegetation on steep slopes, with several streams flowing through vegetated ravines. These streams flow northeast and east beyond the study area and discharge into Richards Creek, which flows west toward Mercer Slough, and then into Lake Washington. There are several recreational hiking trails within the study area.

STUDY OBJECTIVES

The objectives of Herrera's study were to:

- Delineate (flag) all wetlands and streams in the study area.
- Classify vegetation classes within delineated wetlands using the US Fish and Wildlife Service (USFWS) classification system (Cowardin et al. 1979).
- Classify all delineated wetlands using the hydrogeomorphic classification system (Brinson 1993).
- Evaluate wetland functions and values using the *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004).
- Determine wetland categories; stream types; and applicable wetland and stream buffer widths required by Bellevue LUC 20.25H.
- Identify regulations and guidance applicable to project impacts on wetlands, streams, and buffers set forth by local, state, and federal authorities.
- Classify all streams within the study area according to the Washington Department of Natural Resources (WDNR) Forest Practices Water Typing as described in the Washington Administrative Code (WAC 222-16-031).
- Identify habitat associated with species of local importance as described by Bellevue LUC 20.25H.150.
- Describe mitigation sequencing measures (e.g., impact avoidance and minimization) that were considered during design of the project and those that will be implemented during construction in accordance with Bellevue LUC 20.25H.215.
- Detail mitigation that will be provided to offset unavoidable wetland, stream, and buffer impacts in the form of enhancement and restoration measures.

PROJECT OVERVIEW

The proposed project involves the replacement of the existing sewer pipeline within the Woodridge Open Space. The proposed site design includes the following elements:

- Replacement of existing sewer pipeline with 1,275 feet of HDPE sewer pipeline.
- Installation of a new manhole (drop structure) adjacent to the Lake Hills Connector.
- One 20-inch-wide steel bridge over Stream 1 to support the sewer pipeline.
- One 10-inch-diameter steel pipe over Stream 3 to support the sewer pipeline.
- Approximately 320 feet in length of shallow buried pipeline in order for the pipeline to maintain a 2 percent minimum grade required for gravity flow.
- Approximately 38 feet in length of buried pipeline beneath an existing gravel trail crossing within the Woodridge Open Space.

Construction access and staging for the project will be located at both the northern and southern ends of the proposed sewer pipeline. Construction will involve clearing and grubbing existing vegetation within staging areas and where it is necessary to bury the pipeline. In addition, above ground vegetation and woody debris will be cleared to facilitate installation of above ground portions of the pipeline. Select trees will need to be removed from staging areas and along the pipeline corridor. All cleared vegetation will be dispersed on site to retain habitat function. A temporary erosion and sediment control (TESC) plan will be implemented during construction to prevent release of sediments from the site.

REGULATORY COMPLIANCE

Wetlands and streams are subject to a variety of federal, state, and local regulations. Federal laws regulating wetlands and streams include Sections 404 and 401 of the Clean Water Act (United States Code, Title 33, Chapter 1344 [33 USC 1344]). Washington State laws and programs designed to control the loss of wetland acreage include the State Environmental Policy Act (SEPA; administered by local jurisdictions) and Section 401 of the Clean Water Act (administered by the Washington State Department of Ecology [Ecology], as mandated by the Washington State Water Pollution Control Act). The study area is located within the city limits of Bellevue and is, therefore, subject to the jurisdiction's municipal code, which specify wetland categories, stream types, required buffer widths, development standards, and mitigation requirements for critical areas.

State and Federal

Clean Water Act Sections 404 and 401

Section 404 of the federal Clean Water Act regulates the placement or removal of soil or other fill, grading, or alteration (hydrologic or vegetative) in waters of the United States, including wetlands and streams (33 USC 1344). The US Army Corps of Engineers (USACE) administers the permitting program under the act. The permits include nationwide (general) permits for projects involving minor fills, grading, or alteration; and individual permits for projects that require larger areas of disturbance to waters of the United States. USACE does not regulate wetland or stream buffers.

Section 401 of the Clean Water Act requires that proposed dredge (removal) and fill activities permitted under Section 404 be reviewed and certified to ensure that such activities meet state water quality standards. Washington State 401 certification is administered by Ecology for all Section 404 permits. Washington State 401 certification is granted without the need for a separate permit from Ecology for projects that qualify for a Section 404 nationwide permit, meet specific Section 401 certification conditions of the nationwide permit, and meet Ecology 401 General Conditions. If that is not the case, Ecology requires an Individual 401 Water Quality Certification permit.

No wetlands or streams will be filled by the proposed pipeline. Therefore, the project is not required to obtain Section 404 or 401 permits.

Washington State Laws

Washington State laws and programs designed to control the loss of wetlands include SEPA and Section 401 of the Clean Water Act (a federal law that is implemented in the state by Ecology as noted above and as mandated by the Washington State Water Pollution Control Act). SEPA compliance is administered by the City of Bellevue Development Services Department. In support of SEPA compliance, a SEPA environmental checklist will accompany the Critical Areas Land Use Permit application.

The Washington Department of Fish and Wildlife (WDFW) administers the Hydraulic Project Approval (HPA) program under the state Hydraulic Code (WAC 220-110), which was specifically designed to protect fish life. An HPA is required for projects that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state. The proposed pipeline will cross streams and adjacent wetlands; therefore, the project will require an HPA.

In addition, WDFW provides management recommendations for state priority species, including the pileated woodpecker (*Hylatomus pileatus*), which is a state candidate species found within the Woodridge Open Space. WDFW's management recommendations for the pileated woodpecker are included in Appendix B. The project will adhere to those recommendations by

improving habitat conditions by means of planting conifers, preserving snags on the site, and retaining forested conditions that support pileated woodpeckers.

City of Bellevue Land Use Code Compliance

The City regulates critical areas within its boundaries. According to Bellevue LUC 20.25H.025, regulated critical areas include wetlands, streams, shorelines, geologic hazard areas, habitat associated with species of local importance, and areas of special flood hazard. Buffer areas surrounding critical areas are required to protect critical areas' functions and values. Wetlands, streams, geologic hazard areas, and habitat associated with species of local importance are the only types of critical areas that occur within the study area.

The preparation of this report included an evaluation of compliance with the relevant sections of the Bellevue LUC 20.25H that pertain to alteration or development of critical areas (wetlands, streams, and habitat associated with species of local importance only) and required mitigation for impacts including performance standards, criteria, and provisions. Information about geologic hazard areas is reported by Shannon and Wilson (2017) (Appendix A).

Allowable Use and Development

According to Bellevue LUC 20.25H.055.B, the project is classified as an allowable use and development under the category of *new or expanded utility facilities, utility systems, stormwater facilities*. Specifically, the project represents a new utility. In accordance with Bellevue LUC 20.25H.055.C.2, new or expanded facilities and systems are allowed within a critical area or critical area buffer only where no technically feasible alternative with less impact on the critical area or critical area buffer exists.

The following summarizes how the project considered technically feasible alternatives, in compliance with the requirements of Bellevue LUC 20.25H.055.C.2.a.i through v:

- *i. The location of existing infrastructure;*

  The proposed alignment was selected in part, based on the need to tie into existing City-owned manholes at the northern and southern limits of the project. An alternative shorter alignment was considered, but it would have resulted in more extensive wetland impact based on the need to connect to an existing King County sewer located in wetlands associated with Richards Creek (Tetra Tech 2016a).

- *ii. The function or objective of the proposed new or expanded facility or system;*

  The objective of the new facility is to replace an existing, potentially leaking pipeline with a new gravity flow pipeline to prevent release of untreated sewer to the Woodridge Open Space.

- *iii. Demonstration that no alternative location or configuration outside of the critical area or critical area buffer achieves the stated function or objective, including construction of new or expanded facilities or systems outside of the critical area;*

  The majority of Woodridge Open Space is either critical area or critical area buffer that is bounded by residential development, Richards Road, and the Lake Hills Connector. In addition, critical areas and buffers are widespread on the opposite side of these roads including wetlands, Richards Creek, and associated buffers. Therefore, there is no alternative location or configuration on undeveloped lands outside of critical areas or buffers that achieves the project objective of providing a sewer replacement that connects to existing sewer infrastructure.

- *iv. Whether the cost of avoiding disturbance is substantially disproportionate as compared to the environmental impact of proposed disturbance; and*

  To avoid disturbance to critical areas and buffers, the proposed pipeline alignment would need to go around the Woodridge Open Space within existing roadways, substantially increasing the length and cost of the pipeline. The cost would be substantially disproportionate when compared to the impacts of the proposed project, which will be mitigated on site.

- *v. The ability of both permanent and temporary disturbance to be mitigated.*

  The project corridor provides opportunities to mitigate all impacts to critical areas and critical area buffers through restoration and enhancement of existing wetlands and buffers within the study area.

The following summarizes how the proposed alignment, which is determined to be the most technically feasible alternative with the least amount of impact to critical areas, is in compliance with the requirements of Bellevue LUC 20.25H.055.C.2.b.i through viii:

- *i. Location and design shall result in the least impacts on critical area or critical area buffer;*

  After wetland and stream delineations were conducted within the study area, the pipeline alignment was selected to avoid and minimize impacts to these resources to the greatest extent feasible while still meeting the objective of gravity sewer flow. For the most part, the pipeline alignment avoids wetlands except in places where it is necessary to maintain gravity flow along the undulating hillside. The pipeline alignment will completely avoid two of the streams identified (Streams 2 and 4) and the design of the pipeline will avoid direct impact to Streams 1 and 3 by bridging overhead.

- *ii. Disturbance of the critical area and critical area buffer, including disturbance of vegetation and soils, shall be minimized;*

  After significant trees were surveyed within the study area, the pipeline alignment was selected to avoid tree clearing in wetlands and minimize tree clearing in buffers to the

maximum extent feasible. In addition, by primarily placing the pipeline on the ground surface, disturbance to wetland and buffer soils and vegetation is minimized to the greatest extent feasible.

- *iii. Disturbance shall not occur in habitat used for salmonid rearing or spawning or by any species of local importance unless no other technically feasible location exists;*

  The proposed alignment does not occur in any habitat used by salmonid species. Pileated woodpecker, a Bellevue species of local importance, is known to occur in the area. The project will avoid clearing of snags used by pileated woodpecker. Some clearing of significant trees that provide pileated woodpecker habitat is unavoidable. Significant trees are widespread throughout the Woodridge Open Space; therefore, no other technically feasible location exists for the pipeline that would completely avoid tree clearing.

- *iv. Any crossing over a wetland or stream shall be designed to minimize critical area and critical area buffer coverage and critical area and critical area buffer disturbance, for example by use of bridge, boring, or open cut and perpendicular crossings, and shall be the minimum width necessary to accommodate the intended function or objective; provided, that the Director may require that the facility be designed to accommodate additional facilities where the likelihood of additional facilities exists, and one consolidated corridor would result in fewer impacts to the critical area or critical area buffer than multiple intrusions into the critical area or critical area buffer;*

  The pipeline alignment will completely avoid two of the streams identified (Streams 2 and 4) and the design of the pipeline will avoid direct impact to Streams 1 and 3 by bridging overhead. In addition, the length of the bridged pipeline segments over the streams is minimized by crossing in a perpendicular alignment. Furthermore, the bridged segments are designed to the minimum width necessary. When compared to open cut and boring design alternatives considered, the selected bridge crossing design has the least amount of impact to streams, streambanks, soils, and vegetation (Tetra Tech 2016b).

- *v. All work shall be consistent with City of Bellevue codes and standards;*

  The proposed project complies with all City of Bellevue codes and standards.

- *vi. The facility or system shall not have a significant adverse impact on overall aquatic area flow peaks, duration, or volume or flood storage capacity, or hydroperiod;*

  The proposed project will have no impact on the hydrology of existing streams because there will be no direct impacts to the channels and the project does not involve creating impervious surfaces or rerouting of stream flows.

- *vii. Associated parking and other support functions, including, for example, mechanical equipment and maintenance sheds, must be located outside critical area or critical area buffer except where no feasible alternative exists; and*

  The proposed project does not require any parking or other support functions.

- *viii. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.*

  All areas of permanent and temporary disturbance will be mitigated through restoration and enhancement of wetlands and buffers, in compliance with Bellevue LUC 20.25H.210, as presented in this report.

CRITICAL AREAS ASSESSMENT

The following sections summarize the methods used to identify and delineate critical areas and findings within the project study area. Information pertaining to geologic hazard areas is provided in Appendix A.

METHODS

Evaluating the presence, extent, and type of wetlands, streams, and fish and wildlife conservation areas requires a review of available information about the site (e.g., surveys, studies), followed by an onsite wetland and stream delineation and confirmation of existing delineations. The following sections describe the research methods and field protocols for the wetland and stream evaluations. More information about the methodology used in the wetland delineation performed for the project is available in Appendix C.

Review of Available Information

Herrera staff reviewed available literature to determine the historical and current presence of wetlands and streams in and near the study area. Sources of information included:

- Aerial photographs of the study area and project vicinity (ESRI 2015; USDA 2015)
- National Wetlands Inventory map of wetland areas in the study area (USFWS 2014)
- King County iMAP (King County 2016a)
- Bellevue GIS stream layer (Bellevue 2016)
- SalmonScape computer mapping system (WDFW 2016a)
- Washington State Priority Habitats and Species (PHS) data (WDFW 2016b)
- Washington State Natural Heritage data (WDNR 2016)
- Climate data (NRCS 2016a)
- Soils map and soil unit descriptions for the study area (NRCS 2016b)
- Hydric soils list (NRCS 2016c)

Wetland Delineation

The wetland delineation was performed in accordance with the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010) and *US Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

The methods in the manuals listed above use a three-parameter approach for identifying and delineating wetlands, and rely on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. The methods for evaluating those three parameters are further described in Appendix C. The wetland delineation for the project was performed according to procedures specified under the routine wetland determination method (Environmental Laboratory 1987).

To identify wetlands, Herrera wetland biologists evaluated field conditions by traversing the study area and noting potential wetlands, streams, other aquatic features. Areas within 300 feet of the project area were investigated for the presence of critical areas.

A test plot was established for each area that appeared to have potential wetland characteristics. For each test plot, data on dominant plant species, soil conditions in test plots, and evidence of hydrologic conditions were recorded on wetland determination data forms (Appendix D). Plants, soils, and hydrologic conditions were also analyzed and documented in adjacent upland test plot locations. Based on collected data, a determination of wetland or upland was made for each area examined.

Following confirmation of wetland conditions in a given area, the wetland boundary was delineated by placing sequentially numbered, pink-and-black-striped flagging along the wetland perimeter. Test plot locations were also marked with pink-and-black-striped flagging. The locations of wetland boundaries and test plots were subsequently surveyed by True North Land Surveying, Inc.

Wetland Classification, Rating, and Functional Assessment

Wetland Classification

Wetlands observed within the study area were classified according to the USFWS classification system (Cowardin et al. 1979). That system is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate. The wetlands were also classified according to the hydrogeomorphic system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Wetland Rating

In accordance with Bellevue LUC 20.25H.095.B, wetlands were rated using the *Washington State Wetland Rating System for Western Washington-Revised* (Hruby 2004), hereafter referred to as the Ecology rating system. The Ecology rating system categorizes wetlands according to specific attributes such as rarity; sensitivity to disturbance; hydrologic, water quality, and habitat functions; and special characteristics (e.g., mature forested wetland and bog). The total score for all functions determines the wetland rating. The rating system consists of four categories, with Category I wetlands exhibiting outstanding functions and/or special characteristics, and Category IV wetlands exhibiting minimal attributes and functions. The rating categories are used to identify permitted uses in the wetland and its buffer, to determine the width of buffers needed to protect the wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands.

Wetland Functional Assessment

Wetland functions are those physical and chemical processes that occur within a wetland, such as the storage of water, cycling of nutrients, and maintenance of diverse plant communities and habitat that benefit wildlife. Wetland functions are grouped into three broad categories: water quality, hydrologic, and habitat.

- Water quality functions include the potential for removing sediment, nutrients, heavy metals, and toxic organic compounds in the water passing through the wetland.
- Hydrologic functions include reducing the velocity of stormwater, recharging and discharging groundwater, and providing flood storage.
- Habitat functions include providing food, water, and shelter for fish, shellfish, birds, amphibians, and mammals. Wetlands also serve as a breeding ground and nursery for numerous species.

Wetland functions were assessed using the Ecology rating system (Hruby 2004), which is approved by Ecology for evaluating wetland functions in Washington. This system generates a qualitative functional rating (high, moderate, or low) for each of the functions (water quality, hydrology, and habitat) provided by wetlands.

Streams

The OHWMs of streams within the study area were delineated using the definition provided in WAC Section 222-16-010, which has been adopted by the City of Bellevue (LUC 20.50.038). According to that definition, the OHWM of streams is "that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation." In addition,

methods in the publication *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010) were applied.

To delineate the OHWM, Herrera biologists examined the bed and adjacent banks of streams in the study area for indications of regular high water events. Factors considered when assessing changes in vegetation include:

- Scour (removal of vegetation and exposure of gravel, sand, or other soil substrate)
- Drainage patterns
- Elevation of floodplain benches
- Changes in sediment texture across the floodplain
- Sediment layering
- Sediment or vegetation deposition
- Changes in vegetation communities across the floodplain

Herrera biologists hung orange flagging on vegetation at the site, indicating the horizontal location of the OHWM along the stream. The locations of OHWM flags were subsequently surveyed by True North Land Surveying, Inc.

Stream types were determined based on the designation system in Bellevue LUC 20.25H.075. This system is based primarily on fish, wildlife, and human use, and consists of four stream types: Type S, F, N, or O.

- Type S streams are those inventoried as "Shorelines of the State" under the Shoreline Management Master Program for the City of Bellevue, pursuant to RCW Chapter 90.58.
- Type F streams are those that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality.
- Type N streams are those that are not Type S or Type F waters and that are physically connected to a Type S or F water by an above ground system, stream or wetland.
- Type O streams are those that are not Type S, F or N waters and are not physically connected to Type S, F, or N waters by an above ground channel system, stream, or wetland.

Habitat Associated with Species of Local Importance

To evaluate habitat conditions in the study area, Herrera biologists surveyed the study area to identify dominant plant species, forest maturity, concentrations of native and invasive plant populations, other habitat features (such as snags and logs), habitat potential to support fish and wildlife species of local importance, and indications of use by these species.

In addition, Herrera reviewed information on fish use from the SalmonScape mapping program (WDFW 2016a), WDFW's Priority Habitats and Species (PHS) Program (WDFW 2016b), and City of Bellevue basin fact sheets (Bellevue 2009).

RESULTS

This section discusses the results of the wetland and stream delineations, including a review of information obtained from various references, and an analysis of wetland and stream conditions in the study area as observed during field investigations.

Analysis of Available Information

The available existing information compiled for the wetland and stream delineation is summarized in the following subsections.

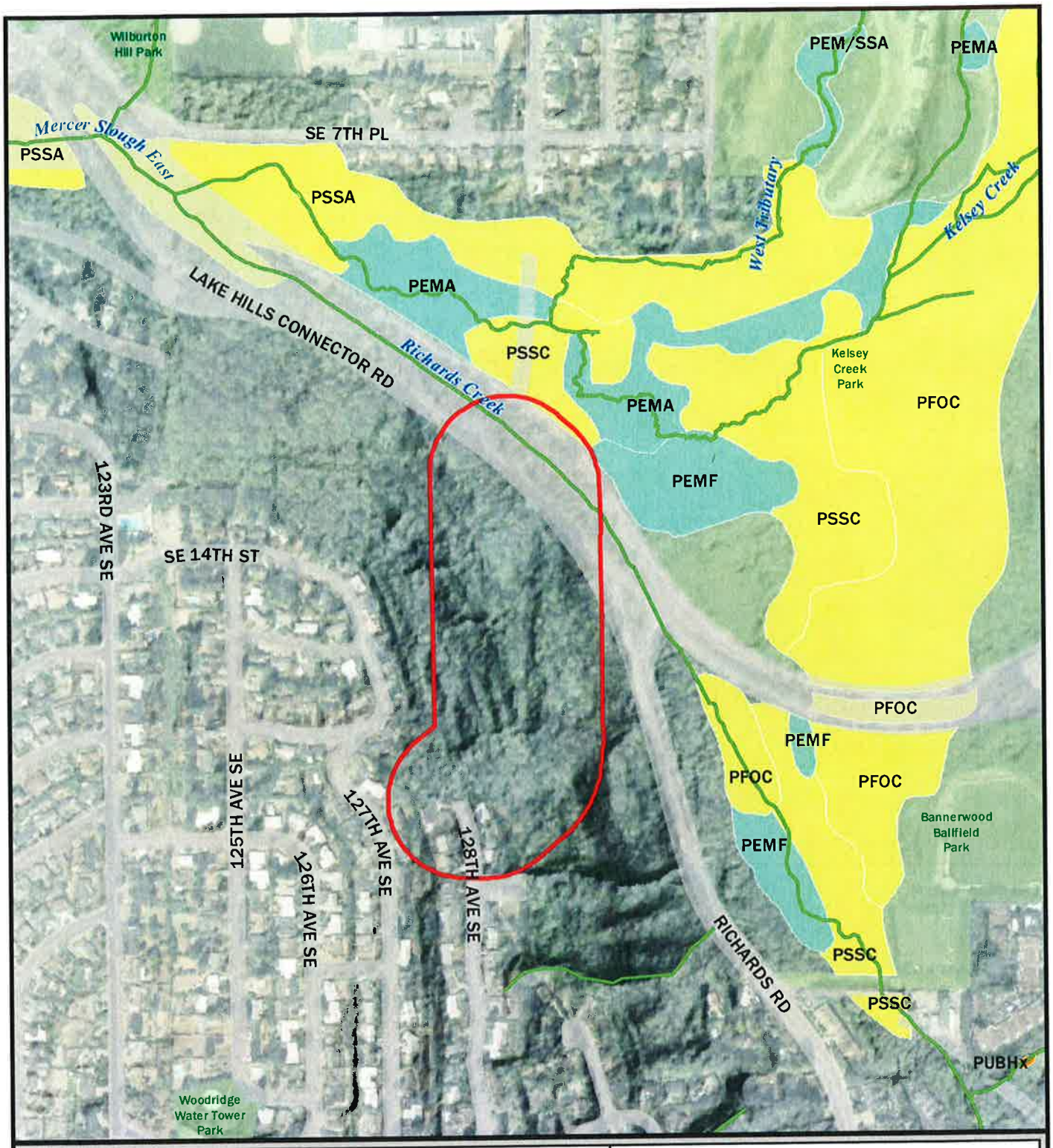
Previously Mapped Wetlands and Streams

Neither the National Wetlands Inventory (USFWS 2014) nor the King County iMAP (King County 2016a) indicate any wetlands within the study area, although there is a large wetland complex near Richards Creek just north of the study area (Figure 2).

The hydrography GIS data for the study area indicates one stream, Richards Creek, flowing through the north end of the study area; and four streams flowing to the northeast and east from within the Woodridge Open Space and into Richards Creek (Bellevue 2016; Figure 2). Richards Creek continues to flow northwest until it joins with the Mercer Slough.

Climate Data

Precipitation characteristics in the weeks and months preceding wetland delineation work for the project are important to understand with respect to potential for drier or wetter than normal wetland conditions on the site. Nearby precipitation gage records were evaluated for that purpose. Precipitation data were obtained from the Natural Resources Conservation Service (NRCS) WETS database (NRCS 2016a). The historical average measurements were based on data collected in Seattle, Washington (WETS Station Seattle Sand Point, WA290 (Latitude 47°41'N, Longitude 122°15'W) for the period of record 1971 to 2000. The station is approximately 7 miles northwest of the study area.



Legend

- Study area
- Stream (Bellevue)

Wetland Type (NWI)

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

Figure 2.
Previously Mapped Wetlands and Streams in the Vicinity of the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

N

0 250 500 1,000 Feet

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Precipitation was evaluated for a 2-week and a 3-month period prior to field investigations, which occurred on October 27 and 31, 2016. Between October 13 and October 26, the historical average precipitation recorded 1.67 inches. Between October 13 and October 26, 2016, 7.51 inches of rain were recorded, which is 5.84 inches above average (NRCS 2016a). In the 3 months preceding the field investigations, the measured rainfall for August 2016 was drier than usual, September 2016 fell within the normal conditions, and October 2016 was wetter than normal (Table 1).

Table 1. Precipitation for the Three-Month Period Preceding Field Investigations.

Prior Month	WETS Historical Rainfall Percentile (inch)		WETS 2016 Measured Rainfall (inch)	Condition: Dry, Wet, Normal
	30th	70th		
August	0.43	1.18	0.05	Dry
September	0.59	2.05	1.53	Normal
October	1.85	4.04	10.30	Wet

Source: WETS Station: Seattle Sand Point, WA290, 1971–2000 (NRCS 2016a)

Mapped Soils

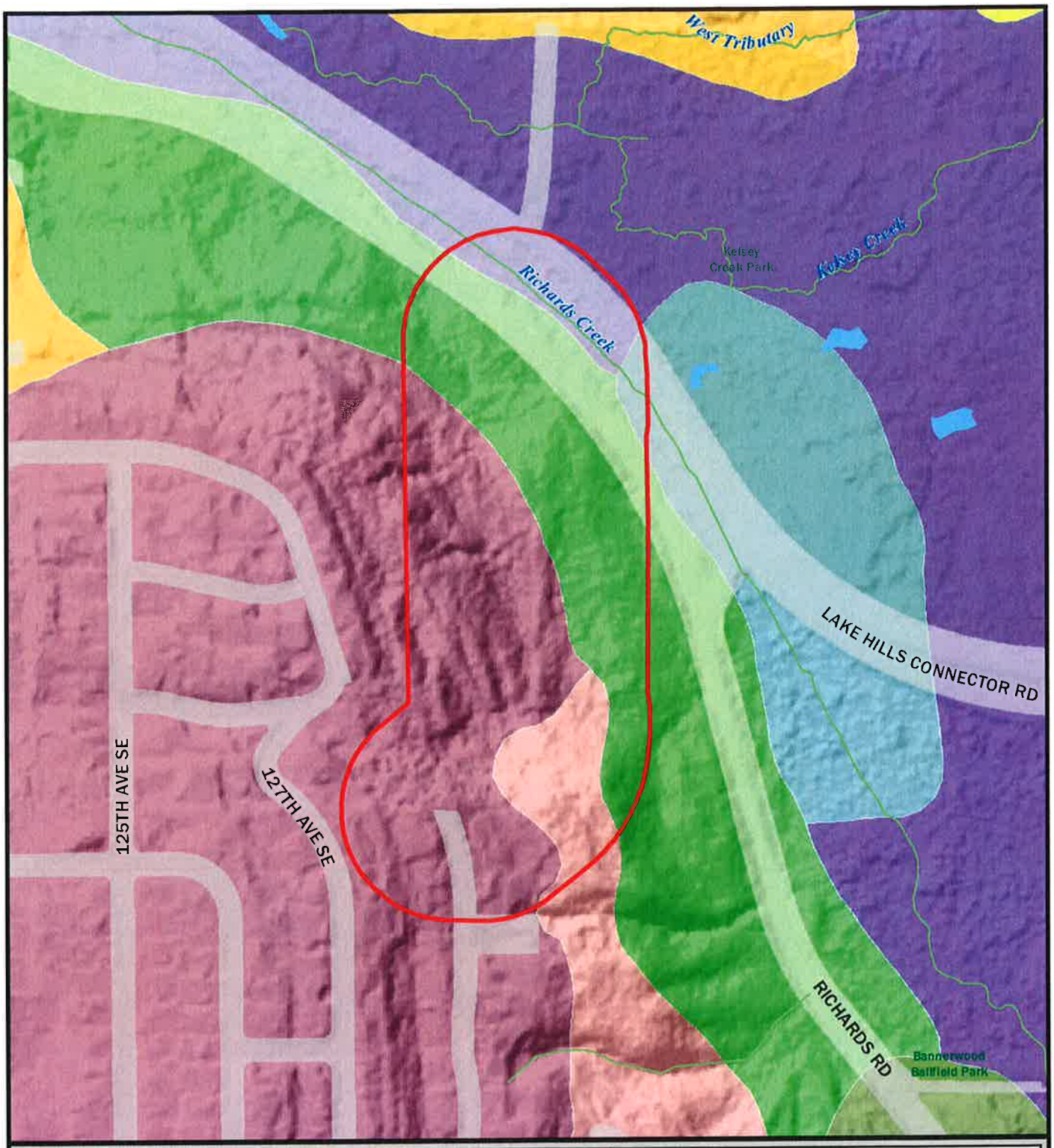
Four soils are mapped in the study area: Arents, Alderwood material, 6 to 15 percent slopes; Alderwood gravelly sandy loam, 15 to 30 percent slopes; Alderwood gravelly sandy loam, 8 to 15 percent slopes; and Kitsap silt loam, 15 to 30 percent slopes (NRCS 2016b; Figure 3). None of the soil series are listed as hydric soils (NRCS 2016c).

Arents, Alderwood Material

Arents are a suborder of Entisols, which have no diagnostic horizons. Some Entisols have steep and actively eroding slopes. There are no diagnostic horizons in Arents soils because they have been deeply mixed by human actions. Arents are found in urban land, as well as pastures, croplands, and forests (NRCS 2016d). The Alderwood soil series consists of moderately deep, moderately well drained soils. Alderwood soils are generally found on glacially modified hills and ridges on glacial drift plains. They are found on slopes of 0 to 65 percent (NRCS 2016b).

Alderwood Gravelly Sandy Loam

Alderwood gravelly sandy loam is a deep, well-drained soil that occurs on glacially modified hills and ridges (NRCS 2016b). Alderwood soils occupy areas of historical glacial moraines and till plains, and they are derived from glacial basal till with some volcanic ash. A typical soil profile includes a 0- to 7-inch surface layer composed of a very dark grayish brown (10YR 3/2) gravely sandy loam; a 14-inch layer of dark yellowish brown (10YR 4/4) very gravelly sandy loam; an 8-inch layer of brown (10YR 4/3) very gravelly sandy loam; a 5-inch layer of 50 percent olive brown (2.5Y 4/4) very gravelly sandy loam; a 8-inch layer of dark grayish brown (2.5Y 4/2) very gravelly sandy loam; and a deep (greater than 30 inches) layer of grayish brown (2.5Y 5/2) dense glacial till that breaks to very gravelly sandy loam (NRCS 2016b).



Legend

- Study area
- Stream (Bellevue)

Soil Type (NRCS)

- Alderwood gravelly sandy loam, 15 to 30 percent slopes
- Alderwood gravelly sandy loam, 8 to 15 percent slopes
- Arents, Alderwood material, 6 to 15 percent slopes
- Bellingham silt loam
- Everett gravelly sandy loam, 0 to 5 percent slopes
- Kitsap silt loam, 15 to 30 percent slopes
- Kitsap silt loam, 2 to 8 percent slopes
- Seattle muck

Figure 3.
Mapped Soils in the Vicinity of the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

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0 175 350 700 Feet

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Kitsap Silt Loam

Kitsap silt loam is a very deep, moderately well-drained soil that occurs on terraces and terrace escarpments (NRCS 2016b). Kitsap soils are formed in lacustrine sediments. A typical soil profile includes a 0- to 6-inch surface layer composed of a very dark grayish brown (10YR 3/2) silt loam; a 4-inch layer of dark brown (10YR 4/3) silt loam; a 7-inch layer of brown (10YR 4/3) silty clay loam; a 15-inch layer of grayish brown (2.5Y 5/2) silty clay loam; and a 28-inch layer of light olive brown (2.5Y 5/4) silt loam and silty clay loam (NRCS 2016b).

Fish Habitat Use

Based on WDFW's PHS mapping, there are four salmon species that are documented or modeled to occur in Richards Creek (WDFW 2016a; Table 2). There are no mapped fish passage barriers on Richards Creek downstream of the study area, or leading to the streams in the Woodridge Open Space (WDFW 2016a).

Table 2. Fish Species Present Within Richards Creek near the Woodridge Open Space Sewer Replacement Project.

Fish Species	Fish Distribution in Richards Creek[a]	Federal Status[b]	State Status[c]	City of Bellevue Species of Local Importance[d]
Fall Chinook (*Oncorhynchus tshawytscha*)	Documented presence	Threatened (Puget Sound)	State Candidate	Yes
Sockeye (*Oncorhynchus nerka*)	Documented presence	–	–	–
Coho (*Oncorhynchus kisutch*)	Documented spawning	–	–	Yes
Winter Steelhead (*Oncorhynchus mykiss*)	Modeled presence	Threatened (Puget Sound)	–	–

[a] Fish distribution is based on SalmonScape mapping (WDFW 2016a).

[b] Federal status from US Fish and Wildlife endangered species list (USFWS 2017).

[c] State status from Washington State Species of Concern Lists (WDFW 2016b).

[d] City of Bellevue species of local importance are based on LUC 20.25H.150.A.

Wildlife Habitat Use

According to WDFW PHS data (WDFW 2016b), Woodridge Open Space is designated as a biodiversity area and corridor, which is considered a priority habitat. There are no documented locations of species within the study area or immediate vicinity of the study area. The nearest mapped wildlife is a bald eagle nest approximately 1.5 miles from the study area near the eastern shore of Lake Washington, and a great blue heron breeding area approximately 1 mile southwest of the study area.

Analysis of Wetland Conditions

Wetland delineation field activities were conducted by Herrera biologists Shelby Petro and Julia Munger on October 27 and 31, 2016. The weather conditions during the fieldwork consisted of daytime high temperatures of approximately 50 degrees Fahrenheit (°F), with rainy conditions. It was determined that delineations were being conducted outside of the growing season (as defined in Appendix C), because aboveground growth and development of vascular plant species was not occurring and soil temperatures at 12 inches below the surface were below 41°F (Environmental Laboratory 2010).

Herrera biologists delineated five wetlands in the study area, Wetlands A through E (Figure 4). Buffer widths shown in Figure 4 provide a representation of the potential regulatory constraints. Detailed descriptions of the wetlands delineated in the study area are provided in Tables 3 through 8. The biologists completed wetland delineation forms (Appendix D) and rating forms (Appendix E) for Wetlands A through E.

Table 3. Wetlands Delineated in the Study Area for the Woodridge Open Space Sewer Replacement Project.

Wetland Name	Size of Wetland (square feet)	USFWS Classification[a]	Hydrogeomorphic Classification[b]	Wetland Rating Category[c]	Buffer Width (feet)[d]
Wetland A	38,507	PFO, PSS	Slope	III	110
Wetland B	97,567[e]	PFO, PSS	Slope	III	110
Wetland C	70,070[e]	PFO, PSS	Slope	III	110
Wetland D	50,526[e]	PFO, PSS	Slope	III	110
Wetland E	1,465	PFO, PSS	Slope	IV	40

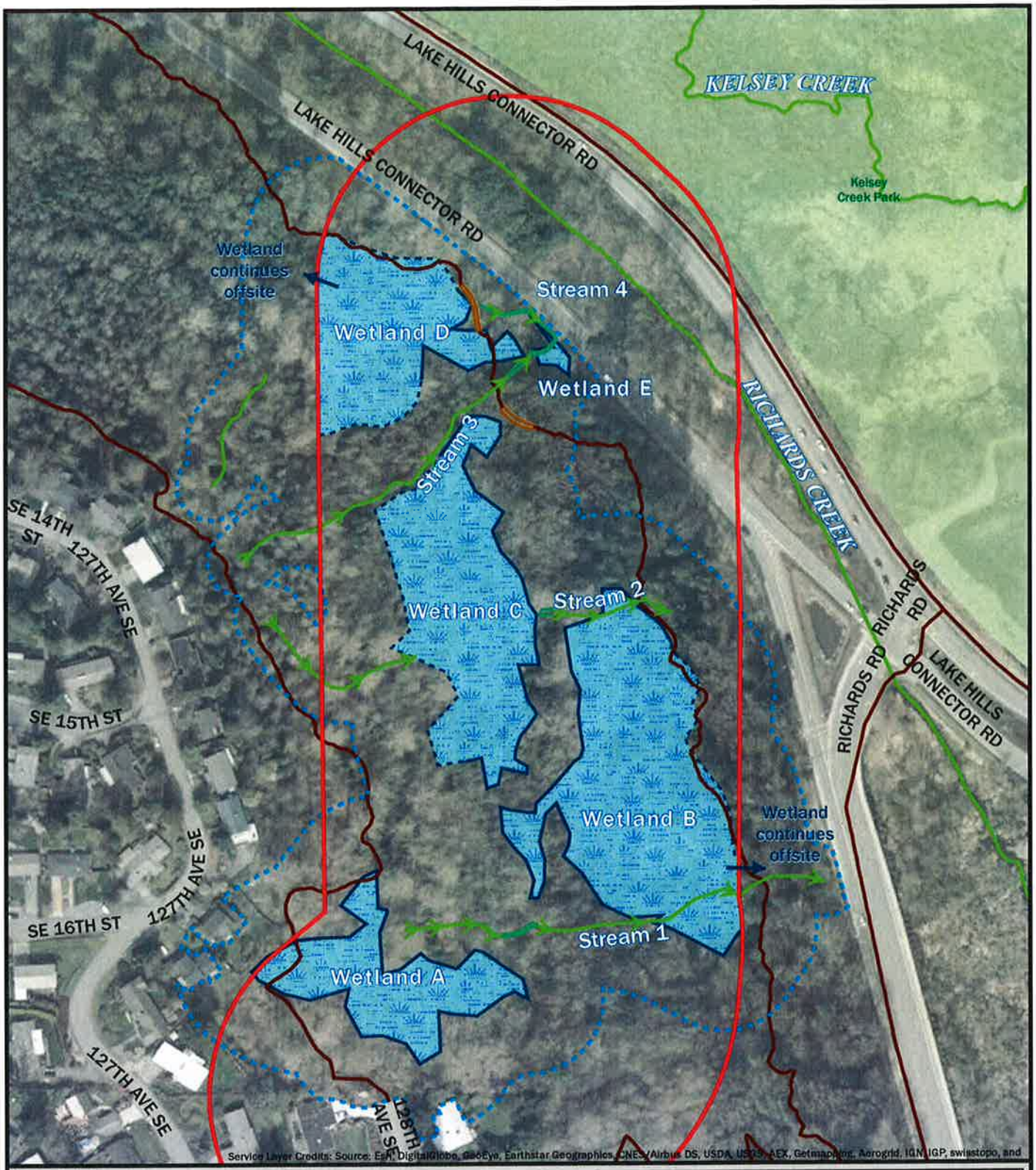
[a] US Fish and Wildlife Service classification is based on Cowardin et al. (1979): palustrine forest (PFO) and palustrine scrub-shrub (PSS).

[b] Hydrogeomorphic classification is based on Brinson (1993).

[c] City wetland category is based on the Washington State Department of Ecology wetland rating system (Hruby 2004) and LUC 20.25H.095.B.

[d] Wetland buffer determined according to LUC 20.25H.095.C.

[e] Estimated wetland size.



Legend

- Study area
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)
- Park

Figure 4.
Wetlands, Streams, and Buffers in the Study Area for the Woodridge Open Space Sewer Replacement Project.

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0 100 200 400 Feet

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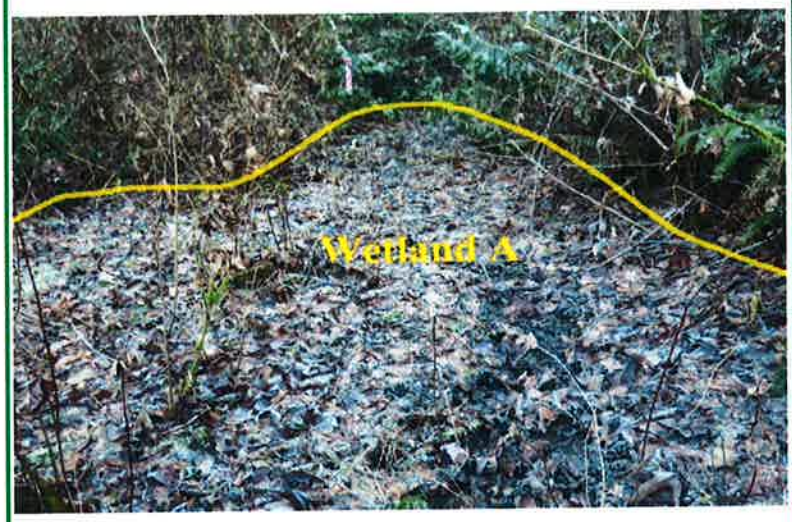
Table 4. Summary for Wetland A.

Wetland Name	Wetland A
Location	Woodridge Open Space, north of 128th Avenue Southeast



Local Jurisdiction	City of Bellevue
WRIA	8
Wetland Rating (2004)	Category III
City of Bellevue Buffer Width	110 feet
Cowardin Classification	Palustrine forested, Palustrine scrub-shrub
Hydrogeomorphic Classification	Slope
Wetland Data Form(s)	Appendix D, TP-A-WET
Upland Data Form(s)	Appendix D, TP-A-UPL

Size of Delineated Wetland	38,507 square feet (0.88 acre)
Dominant Vegetation	Wetland A is dominated by salmonberry (*Rubus spectabilis*) and red alder (*Alnus rubra*), with patches of lady fern (*Athyrium filix-femina*) in the understory.
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At the wetland test plot (TP-A-WET), the soil in the top 5 inches below the surface was very dark grayish brown (10YR 3/2) loam, with redoximorphic concentrations in the matrix (5YR 4/6, 5 percent). The soil from 5 to 20 inches below the surface was very dark grayish brown (2.5Y 3/2) sandy loam, with redoximorphic concentrations in the matrix (10YR 5/6, 20 percent). This soil profile meets the Sandy Redox (S5) hydric soil indicator. At the upland test plot (TP-A-UPL), the top 14 inches of soil was a very dark greyish brown (10YR 3/2) loam, with redoximorphic concentrations in the matrix (10YR 4/4, 1 percent). The soil from 14–20 inches below the surface was brown (10YR 4/3) loam, with redoximorphic concentrations in the matrix (10YR 3/2 [1 percent] and 7.5YR 5/8 [1 percent]). The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-A-WET, soils were saturated to the surface with a water table depth of approximately 4 inches. The wetland plot met the hydrology indicators for high water table (A2) and saturation (A3). Hydrologic inputs to this wetland are primarily from groundwater seeps, with some hydrologic inputs from Stream 1.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Bellevue Land Use Code (LUC 20.25H.095) classifies wetlands per the Ecology rating system (Hruby 2004), which rates Wetland A as Category III.
Buffer Condition	Buffers adjacent to the wetland consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space. Existing buffers provide moderate wildlife habitat and water quality functions.

Table 5. Summary for Wetland B.

Wetland Name	Wetland B
Location	Woodridge Open Space, southwest of Lake Hills Connector

Local Jurisdiction	City of Bellevue
WRIA	8
Wetland Rating (2004)	Category III
City of Bellevue Buffer Width	110 feet
Cowardin Classification	Palustrine forested, Palustrine scrub-shrub
Hydrogeomorphic Classification	Slope
Wetland Data Form(s)	Appendix D, TP-B-WET
Upland Data Form(s)	Appendix D, TP-B-UPL

Size of Delineated Wetland	Approximately 97,567 square feet (2.24 acres).
Dominant Vegetation	Wetland B is dominated by salmonberry in the overstory, and trailing blackberry (*Rubus ursinus*) and giant horsetail (*Equisetum telmateia*) in the understory.
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At the wetland test plot (TP-B-WET), the soil in the top 6 inches below the surface was dark gray (10YR 4/1) loam, with redoximorphic concentrations in the matrix (2.5Y 4/3, 2 percent). The soil from 6 to 20 inches below the surface was dark gray (5Y 4/1) silt loam with redoximorphic concentrations in the matrix (10YR 5/4, 50 percent). This soil profile meets the Depleted Matrix (F3) hydric soil indicator. At the upland test plot (TP-B-UPL), the top 20 inches of soil was a mix of 50 percent dark gray (2.5Y 4/1) loam and 50 percent light olive brown (2.5Y 5/3) loam. The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-B-WET, soils were saturated to the surface with a water table depth of approximately 6 inches. The wetland plot met the hydrology indicators for high water table (A2) and saturation (A3). Hydrologic inputs to this wetland are primarily from groundwater seeps, with some hydrologic inputs from Streams 1 and 2.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Bellevue Land Use Code (LUC 20.25H.095) classifies wetlands per the Ecology rating system (Hruby 2004), which rates Wetland B as Category III.
Buffer Condition	Buffers adjacent to the wetland consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space. Existing buffers provide moderate wildlife habitat and water quality functions.

Table 6. Summary for Wetland C.

Wetland Name	Wetland C
Location	Woodridge Open Space, south of Lake Hills Connector

Local Jurisdiction	City of Bellevue
WRIA	8
Wetland Rating (2004)	Category III
City of Bellevue Buffer Width	110 feet
Cowardin Classification	Palustrine forested, Palustrine scrub-shrub
Hydrogeomorphic Classification	Slope
Wetland Data Form(s)	Appendix D, TP-C-WET
Upland Data Form(s)	Appendix D, TP-C-UPL

Size of Delineated Wetland	Approximately 70,070 square feet (1.61 acres).
Dominant Vegetation	Wetland C is dominated by salmonberry, red-osier dogwood (*Cornus sericea*), and red alder, with patches of lady fern and giant horsetail in the understory.
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At the wetland test plot (TP-C-WET), the soil in the top 6 inches below the surface was dark gray (5Y 4/1) silt loam, with redoximorphic concentrations in the matrix (10YR 4/2 [5 percent] and 7.5YR 4/4 [2 percent]). The soil from 6 to 20 inches below the surface was dark gray (5Y 4/1) silt loam, with redoximorphic concentrations in the matrix (10YR 5/4 [40 percent] and 7.5YR 4/6 [10 percent]). This soil profile meets the Depleted Matrix (F3) hydric soil indicator. At the upland test plot (TP-C-UPL), the top 20 inches of soil was a very dark grayish brown (10YR 3/2) loam (100 percent). The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-C-WET, soils were saturated to the surface with a water table depth of approximately 6 inches. The wetland plot met the hydrology indicators for high water table (A2) and saturation (A3). Hydrologic inputs to this wetland are primarily from groundwater seeps, with some hydrologic inputs from Streams 2 and 3.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Bellevue Land Use Code (LUC 20.25H.095) classifies wetlands per the Ecology rating system (Hruby 2004), which rates Wetland C as Category III.
Buffer Condition	Buffers adjacent to the wetland consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space. Existing buffers provide moderate wildlife habitat and water quality functions.

Table 7. Summary for Wetland D.

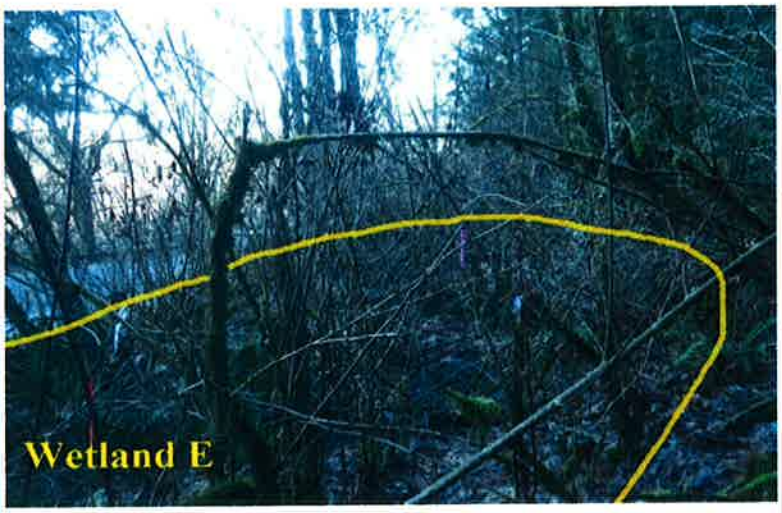
Wetland Name	Wetland D
Location	Woodridge Open Space, southwest of Lake Hills Connector

Local Jurisdiction	City of Bellevue
WRIA	8
Wetland Rating (2004)	Category III
City of Bellevue Buffer Width	110 feet
Cowardin Classification	Palustrine forested, Palustrine scrub-shrub
Hydrogeomorphic Classification	Slope
Wetland Data Form(s)	Appendix D, TP-D-WET
Upland Data Form(s)	Appendix D, TP-D-UPL

Size of Delineated Wetland	Approximately 50,526 square feet (1.16 acres).
Dominant Vegetation	Wetland D is dominated by salmonberry, red alder, and red-osier dogwood in the overstory, with piggy-back plant (*Tolmiea menziesii*) in the understory.
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At the wetland test plot (TP-D-WET), the soil in the top 20 inches below the surface was gray (2.5Y 5/1) silt loam, with redoximorphic concentrations in the matrix (10YR 5/4 [20 percent] and 7.5YR 4/6 [5 percent]). This soil profile meets the Depleted Matrix (F3) hydric soil indicator. At the upland test plot (TP-D-UPL), the top 20 inches of soil was an olive brown (2.5Y 4/3) loam, with redoximorphic concentrations in the matrix (2.5Y 5/4, 40 percent). The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-D-WET, soils were saturated to the surface. The wetland plot met the hydrology indicator for saturation (A3). Hydrologic inputs to this wetland are primarily from groundwater seeps, with hydrologic input from Stream 4.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Bellevue Land Use Code (LUC 20.25H.095) classifies wetlands per the Ecology rating system (Hruby 2004), which rates Wetland D as Category III.
Buffer Condition	Buffers adjacent to the wetland consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space. The northern part of Wetland D is adjacent to Lake Hills Connector, and the southern part of the wetland is adjacent to a hiking trail. Existing buffers provide low to moderate wildlife habitat and water quality functions.

Table 8. Summary for Wetland E.

Wetland Name	Wetland E
Location	Woodridge Open Space, southwest of Lake Hills Connector



Local Jurisdiction	City of Bellevue
WRIA	8
Wetland Rating (2004)	Category IV
City of Bellevue Buffer Width	40 feet
Cowardin Classification	Palustrine forested, Palustrine scrub-shrub
Hydrogeomorphic Classification	Slope
Wetland Data Form(s)	Appendix D, TP-E-WET
Upland Data Form(s)	Appendix D, TP-E-UPL

Size of Delineated Wetland	1,465 square feet (0.04 acre).
Dominant Vegetation	Wetland E is dominated by salmonberry and red-osier dogwood in the overstory, with piggy-back plant in the understory.
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At the wetland test plot (TP-E-WET), the soil in the top 5 inches below the surface was dark gray (2.5Y 4/1) silt loam, with redoximorphic concentrations in the matrix (2.5Y 4/4, 20 percent). The soil from 5 to 20 inches below the surface was gray (2.5Y 5/1) silt loam, with redoximorphic concentrations in the matrix (2.5Y 5/6 [30 percent] and 7.5YR 4/4 [5 percent]). This soil profile meets the Depleted Matrix (F3) hydric soil indicator. At the upland test plot (TP-E-UPL), the top 20 inches of soil was a very dark brown (10YR 2/2) loam (100 percent). The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-E-WET, soils were saturated to the surface with a water table depth of approximately 7 inches. The wetland plot met the hydrology indicators for high water table (A2) and saturation (A3). Hydrologic inputs to this wetland are primarily from groundwater seeps, with some hydrologic inputs from Stream 3.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Bellevue Land Use Code (LUC 20.25H.095) classifies wetlands per the Ecology rating system (Hruby 2004), which rates Wetland E as Category IV.
Buffer Condition	Buffers adjacent to the wetland consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space. The northern part of Wetland E is adjacent to Lake Hills Connector. Existing buffers provide low wildlife habitat and water quality functions.

Evaluation of Wetland Functions

A summary of the function scores, the total wetland score, and the associated rating (category) for Wetlands A through E is provided in Table 9. A description of functions is provided below.

Table 9. Individual Wetland Function Scores for Wetlands in the Study Area for the Woodridge Open Space Sewer Replacement Project.

Wetland Name	Water Quality Functions Rating a (numerical score in parentheses)		Hydrologic Functions Rating a (numerical score in parentheses)		Habitat Functions Rating a (numerical score in parentheses)		Total Score[b]	Washington State Department of Ecology Rating Category[c]
	Potential	Opportunity	Potential	Opportunity	Potential	Opportunity		
A	Low (1)	Yes	Low (2)	Yes	Moderate (10)	High (14)	30	III
B	Low (1)	Yes	Low (2)	Yes	Moderate (11)	High (14)	31	III
C	Low (1)	Yes	Low (2)	Yes	Moderate (10)	High (14)	30	III
D	Low (2)	Yes	Low (2)	Yes	Moderate (10)	Moderate (13)	31	III
E	Low (2)	Yes	Low (2)	Yes	Moderate (10)	Moderate (10)	28	IV

[a] Qualitative ratings are based on the Washington State Department of Ecology (Ecology) "Using the Wetland Rating System in Compensatory Mitigation" focus sheet (Ecology 2008)

[b] Total score is derived by multiplying the numerical rating by 2 when there is opportunity for improving water quality or hydrologic functions and by 1 when there is none. Then all scores are summed to derive the total.

[c] Wetland category is based on the Ecology rating system (Hruby 2004).

Wetland A

Wetland A, a slope wetland, has a low potential to improve water quality primarily because the wetland is steeply sloped and lacks dense vegetation, which does not allow for long-term water retention or filtration on site. However, it has the opportunity to improve water quality due to its location in an area that has several pollution sources, including residential areas upslope. The wetland also has low potential to improve hydrologic functions such as reducing flooding, because it lacks dense vegetation. Wetland A has the opportunity to reduce flooding and erosion because it drains into Richards Creek, which experiences flooding problems downstream of the Richards Creek and Kelsey Creek confluence. Wetland A exhibits moderate potential to improve habitat functions because it is well vegetated, contains several hydroperiods and habitat features, and has high interspersion of habitat types. The opportunity for the wetland to improve habitat functions is high because of the large vegetated buffers, nearby WDFW priority habitats, and proximity to other wetlands.

Wetland B

Wetland B, a slope wetland, has a low potential to improve water quality primarily because the wetland is steeply sloped and lacks dense vegetation, which does not allow for long-term water retention or filtration on site. However, it has the opportunity to improve water quality due to its

location in an area that has several pollution sources, including residential areas upslope. The wetland also has low potential to improve hydrologic functions such as reducing flooding, because it lacks dense vegetation. Wetland B has the opportunity to reduce flooding and erosion because it drains into Richards Creek, which experiences flooding problems downstream of the Richards Creek and Kelsey Creek confluence. Wetland B exhibits moderate potential to improve habitat functions because it is well vegetated, contains several hydroperiods and habitat features, and has high interspersion of habitat types. The opportunity for the wetland to improve habitat functions is high because of the large vegetated buffers, nearby WDFW priority habitats, and proximity to other wetlands.

Wetland C

Wetland C, a slope wetland, has a low potential to improve water quality primarily because the wetland is steeply sloped and lacks dense vegetation, which does not allow for long-term water retention or filtration on site. However, it has the opportunity to improve water quality due to its location in an area that has several pollution sources, including residential areas upslope. The wetland also has low potential to improve hydrologic functions such as reducing flooding, because it lacks dense vegetation. Wetland C has the opportunity to reduce flooding and erosion because it drains into Richards Creek, which experiences flooding problems downstream of the Richards Creek and Kelsey Creek confluence. Wetland C exhibits moderate potential to improve habitat functions because it is well vegetated, contains several hydroperiods and habitat features, and has high interspersion of habitat types. The opportunity for the wetland to improve habitat functions is high because of the large vegetated buffers, nearby WDFW priority habitats, and proximity to other wetlands.

Wetland D

Wetland D, a slope wetland, has a low potential to improve water quality primarily because the wetland is steeply sloped and lacks dense vegetation, which does not allow for long-term water retention or filtration on site. However, it has the opportunity to improve water quality due to its location in an area that has several pollution sources, including residential areas upslope and recreational hiking trails that allow dogs. The wetland also has low potential to improve hydrologic functions such as reducing flooding, because it lacks dense vegetation. Wetland D has the opportunity to reduce flooding and erosion because it drains into Richards Creek, which experiences flooding problems downstream of the Richards Creek and Kelsey Creek confluence. Wetland D exhibits moderate potential to improve habitat functions because it is well vegetated, contains several hydroperiods and habitat features, and has moderate interspersion of habitat types. The opportunity for the wetland to improve habitat functions is moderate because of the relatively undisturbed vegetated buffers, nearby WDFW priority habitats, and proximity to other wetlands.

Wetland E

Wetland E, a slope wetland, has a low potential to improve water quality primarily because the wetland is steeply sloped and lacks dense vegetation, which does not allow for long-term water retention or filtration on site. However, it has the opportunity to improve water quality due to its location in an area that has several pollution sources, including residential areas upslope and recreational hiking trails that allow dogs. The wetland also has low potential to improve hydrologic functions such as reducing flooding, because it lacks dense vegetation. Wetland E has the opportunity to reduce flooding and erosion because it drains into Richards Creek, which experiences flooding problems downstream of the Richards Creek and Kelsey Creek confluence. Wetland E exhibits moderate potential to improve habitat functions because it is well vegetated, contains several hydroperiods and habitat features, and has moderate interspersion of habitat types. The opportunity for the wetland to improve habitat functions is moderate because of the relatively undisturbed vegetated buffers, nearby WDFW priority habitats, and proximity to other wetlands.

Analysis of Stream Conditions

Five streams were identified within the study area: Richards Creek and Streams 1 through 4. Herrera biologists Shelby Petro and Julia Munger completed the stream delineations on October 27 and 31, 2016. The stream characteristics are summarized in Tables 10 through 14.

Richards Creek is a fish-bearing stream that originates within the city of Bellevue, south of Interstate 90. Richards Creek flows north through the study area, then into Kelsey Creek, which flows into the Mercer Slough and eventually Lake Washington. Stream 3 is an unnamed, perennial stream with fish habitat (Type F) in the vicinity of the proposed sewer crossing. Further upstream (to the west), Stream 3 does not contain fish habitat (Type N) due to channel gradients that exceed 16 percent and channel widths less than 2 feet. The other streams identified within the study area are unnamed, perennial streams (flow was observed during field work; therefore, perennial flow is assumed) that do not contain fish habitat (Type N) due to high gradients and/or narrow channel widths.

All four streams flow from the Woodridge Open Space into Richards Creek, via culverts under Lake Hills Connector. Stream 1 originates uphill of Wetland A and flows east through the study area, through Wetlands A and B. Stream 2 originates west of the study area and flows through Wetlands C and D. Stream 3 originates west of the study area and flows through or adjacent to Wetlands C, D, and E. Stream 4 originates west of the study area and flows through Wetland D. The buffers of each of these streams consist of mixed upland coniferous-deciduous forest and shrubs within the Woodridge Open Space, as well as Wetlands A through E. The upland buffer is dominated by western red cedar (*Thuja plicata*), red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), and sword fern (*Polystichum munitum*). The wetland portion of the buffer is dominated by red alder, salmonberry (*Rubus spectabilis*), and red-osier dogwood (*Cornus sericea*). The stream buffers are relatively undisturbed. While much of the area is healthy forest,

there are hiking trails through the Woodridge Open Space, as well as residential areas in the upper reaches of the streams and Lake Hills Connector that interrupts portions of the buffers.

Table 10. Summary Table for Richards Creek.

Stream Name	**Richards Creek**
Local Jurisdiction	City of Bellevue
WDNR Stream Type	Type F
Local Stream Rating	Type F
Local Jurisdiction Buffer Width	100 feet
Documented Fish Habitat Use	There is documented presence of fall Chinook and sockeye, and documented spawning of coho within Richards Creek. There is also modeled presence of winter steelhead (WDFW 2016a).
Location of Stream Relative to Project Corridor	Richards Creek flows northwest through the northern portion of the study area.
Connectivity (where stream flows from/to)	Richards Creek is a fish-bearing stream that originates within the city of Bellevue, south of Interstate 90. Richards Creek flows north through the study area, then into Kelsey Creek, which flows into the Mercer Slough and eventually Lake Washington.
Riparian/Buffer Condition	Within the study area, the Richards Creek buffer is degraded. This section of the stream flows between two lanes of Lake Hills Connector. The buffer largely consists of wetland habitat with dominant reed canarygrass (*Phalaris arundinacea*), red alder, and willow species (*Salix* spp.).

Table 11. Summary Table for Stream 1.	
Stream Name	**Stream 1**
	
Local Jurisdiction	City of Bellevue
WDNR Stream Type	Type Np
Local Stream Rating	Type N
Local Jurisdiction Buffer Width	50 feet
Documented Fish Habitat Use	Stream 1 is an unnamed perennial stream. There are no fish documented in this stream (WDFW 2016a), although there is documented presence of fall Chinook and sockeye, and documented spawning of coho within Richards Creek, which is within the study area but across Lake Hill Connector from the project area.
Location of Stream Relative to Project Corridor	Stream 1 flows east through the southern portion of the study area.
Connectivity (where stream flows from/to)	Stream 1 originates near the southern portion of the study area uphill of Wetland A and flows east through the study area. It flows through a culvert under Lake Hills Connector and into Richards Creek.
Riparian/Buffer Condition	Within the study area, Stream 1 originates near Wetland A, and flows through Wetlands A and B. The buffer is composed of mixed coniferous-deciduous forest with shrub understory that provides shading and is generally of moderate quality. The buffer is dominated by red alder, big-leaf maple, western red cedar, salmonberry, and sword fern.

Table 12. Summary Table for Stream 2.	
Stream Name	**Stream 2**
	
Local Jurisdiction	City of Bellevue
WDNR Stream Type	Type Np
Local Stream Rating	Type N
Local Jurisdiction Buffer Width	50 feet
Documented Fish Habitat Use	Stream 2 is an unnamed perennial stream. There are no fish documented in this stream (WDFW 2016a), although there is documented presence of fall Chinook and sockeye, and documented spawning of coho within Richards Creek, which is within the study area but across Lake Hill Connector from the project area.
Location of Stream Relative to Project Corridor	Stream 2 flows east through the center of the study area.
Connectivity (where stream flows from/to)	Stream 2 originates west of the study area within the Woodridge Open Space. Stream 2 flows through Wetlands B and C, and then through a culvert under Lake Hills Connector and into Richards Creek.
Riparian/Buffer Condition	Within the study area, the buffer is composed of mixed coniferous-deciduous forest with shrub understory that provides shading and is generally of moderate quality. At the eastern edge of the site, the stream goes through a culvert and the buffer is interrupted by the Lake Hills Connector. The vegetated buffer is dominated by red alder, big-leaf maple, western red cedar, salmonberry, and sword fern.

Table 13. Summary Table for Stream 3.

Stream Name	Stream 3
	
Local Jurisdiction	City of Bellevue
WDNR Stream Type	Type Np and F
Local Stream Rating	Type N and F
Local Jurisdiction Buffer Width	50 feet (Type N) and 100 feet (Type F)
Documented Fish Habitat Use	Stream 3 is an unnamed, perennial stream with fish habitat (Type F) in the vicinity of the proposed sewer crossing. Further upstream (to the west), Stream 3 does not contain fish habitat (Type N) due to channel gradients that exceed 16 percent and channel widths fewer than 2 feet. There are no fish documented in this stream (WDFW 2016a), although there is documented presence of fall Chinook and sockeye, and documented spawning of coho within Richards Creek, which is within the study area but across Lake Hill Connector from the project area.
Location of Stream Relative to Project Corridor	Stream 3 flows northeast through the northern portion of the study area.
Connectivity (where stream flows from/to)	Stream 3 originates west of the study area within the Woodridge Open Space. Stream 3 flows northeast through or adjacent to Wetlands C, D, and E, and then through a culvert under Lake Hills Connector and into Richards Creek.
Riparian/Buffer Condition	Within the study area, the buffer is composed of mixed coniferous-deciduous forest with shrub understory that provides shading and is generally of moderate quality. At the northern end of the site, the stream goes through a culvert and the buffer is interrupted by the Lake Hills Connector. The vegetated buffer is dominated by red alder, big-leaf maple, western red cedar, salmonberry, and sword fern.

Table 14. Summary Table for Stream 4.

Stream Name	Stream 4
	
Local Jurisdiction	City of Bellevue
WDNR Stream Type	Type Np
Local Stream Rating	Type N
Local Jurisdiction Buffer Width	50 feet
Documented Fish Habitat Use	Stream 4 is an unnamed perennial stream. There are no fish documented in this stream (WDFW 2016a), although there is documented presence of fall Chinook and sockeye, and documented spawning of coho within Richards Creek, which is within the study area but across Lake Hill Connector from the project area.
Location of Stream Relative to Project Corridor	Stream 4 flows northeast through the northern portion of the study area.
Connectivity (where stream flows from/to)	Stream 4 originates west of the study area within the Woodridge Open Space. Stream 4 sheet flows northeast through Wetland D, flows in a channel on the hillside, then joins with Stream 3 upstream of the culvert that conveys flows under Lake Hills Connector and into Richards Creek.
Riparian/Buffer Condition	Within the study area, the buffer is composed of mixed coniferous-deciduous forest with shrub understory that provides shading and is generally of moderate quality. At the northern end of the site, the stream goes through a culvert and the buffer is interrupted by the Lake Hills Connector. The vegetated buffer is dominated by red alder, big-leaf maple, western red cedar, salmonberry, and sword fern.

Analysis of Habitats Associated with Species of Local Importance

Herrera examined the presence of species of local importance with a primary association with habitats occurring within the study area. The following species may occur based on the presence of suitable habitat and/or documented occurrence:

- **Pileated woodpecker:** There is good habitat for pileated woodpeckers, including large trees and snags, and an adult pileated woodpecker was observed feeding during the site visit in October 2016.

- **Fish species:** Fish species of local importance occurring in the study area within Richards Creek include Chinook salmon and coho salmon (WDFW 2016a). Culverts conveying streams beneath the Lake Hills Connector and segments of steep stream segments potentially pose barriers to fish passage. Therefore, it is unlikely that there are fish species of local importance occur within Streams 1 through 4 within the study area. However, all impacts near streams will take place landward of the OHWM and will have no adverse effects to fish species if they were to occur.

- **Vaux's swift:** There is potential nesting habitat for Vaux's swift in hollows of snags at the site. However, Vaux's swift are more closely associated with old-growth forested habitat, which is not present in the study area (Larsen et al. 2004). Vaux's swift are not expected to occur within the study area.

Several species of local importance are not expected to occur either because the species are not present or because suitable habitat is not present. There is little to no habitat for bald eagle, peregrine falcon, merlin, osprey, great blue heron, green heron, or red-tailed hawk due to the closed canopy and dense vegetation that precludes access. There is no habitat for common loon, purple martin, or western grebe, which require lakeshore habitat.

There is no habitat for Oregon spotted frog, western pond turtle, or western toad, all of which require perennial water sources and pools.

Bull trout are not known to occur in Richards Creek (WDFW 2016a). River lamprey are associated with large river systems, not small streams like Richards Creek or Streams 1 through 4 (USFWS 2004).

There is no habitat for Western big-eared bat, Keen's myotis, long-legged myotis, and long-eared myotis, which are all bat species listed as species of local importance. Western big-eared bat (also known as Townsend's big-eared bat) are found primarily in arid coniferous forests. Keen's myotis require temperate rain forests, while the Long-legged myotis are found in coniferous forests near waterbodies, preferably lakes. Long-eared myotis require old-growth forests adjacent to rocky outcroppings (Eder 2002).

IMPACT ASSESSMENT

As a result of the proposed project, there will be unavoidable permanent impacts to Wetlands A, B, and C, Streams 1 and 3, and wetland and stream buffers; as well as temporary impacts to Wetlands A, B, and C, and wetland and stream buffers. Permanent impacts will occur where the proposed sewer pipeline will be installed, while construction and staging areas represent areas of temporary impacts (Table 15 and Figure 5). Permanent and temporary impacts will be mitigated on site. (See *Mitigation Approach* section of this report.)

Table 15. Summary of Impacts for the Woodridge Open Space Sewer Replacement Project.

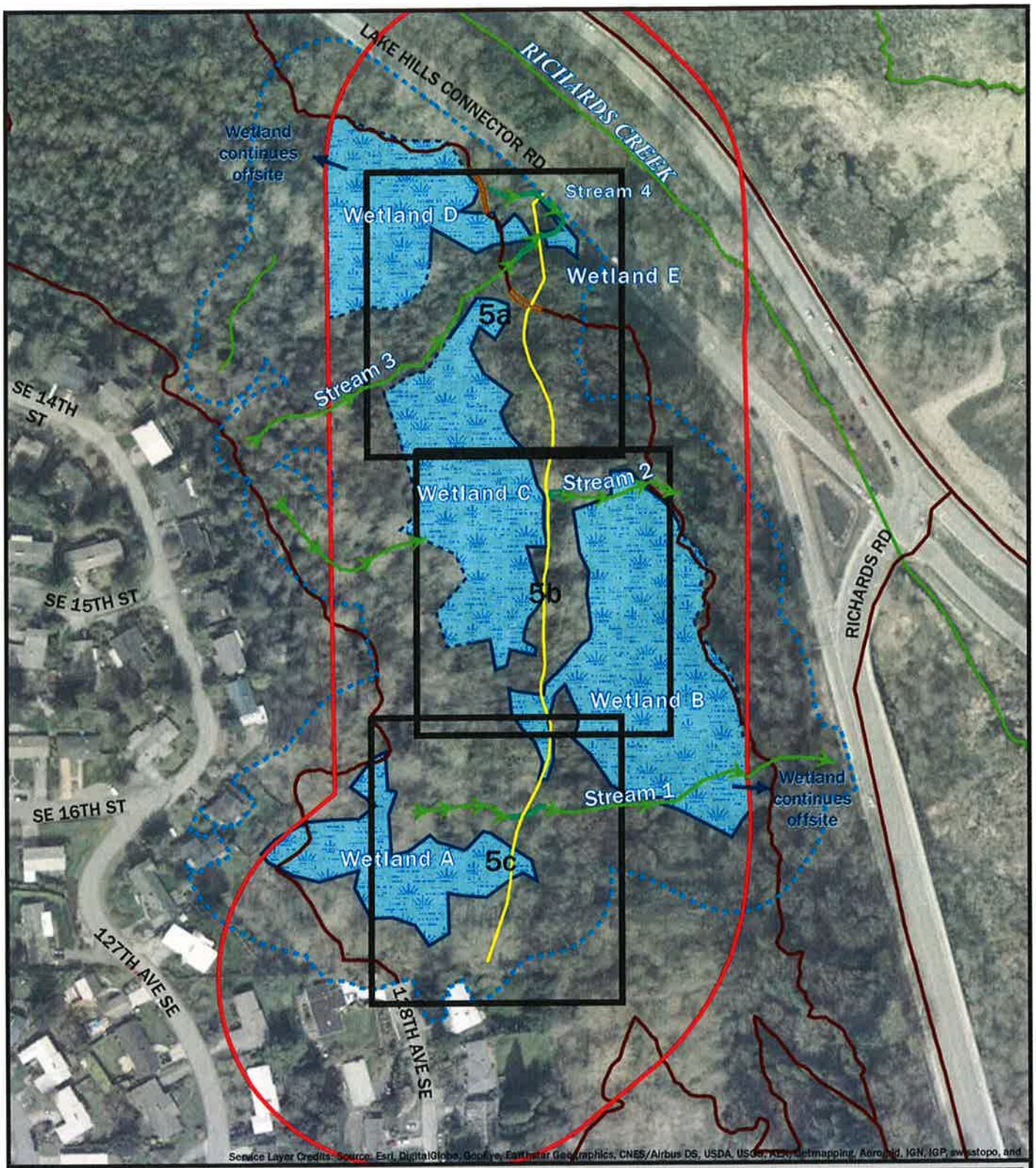
Project Element	Temporary Wetland Impact (square feet)	Temporary Buffer Impact (square feet)	Temporary Stream Impact (square feet)	Permanent Wetland Impact (square feet)	Permanent Stream Impact (square feet)	Permanent Buffer Impact (square feet)
Aerial Crossings at Streams	–	–	–	–	12	–
Pipeline	–	–	–	110	–	663
Pipeline Construction Corridor	553	3,832	–	–	–	–
Staging Areas	–	10,253	145	–	–	–
Total	**553**	**14,085**	**145**	**110**	**12**	**663**

PERMANENT IMPACTS

The permanent wetland impacts will be where the pipeline rests on or below the ground within Wetlands A, B, and C. The permanent stream impacts will be where the pipeline crosses above Streams 1 and 3. The bridge supporting the pipeline above Stream 1 will be 20 inches wide and will account for 9 square feet of impact. The steel pipe supporting the pipeline above Stream 3 will be 10 inches wide and will account for 3 square feet of impact. The permanent buffer impacts will be where a new manhole is installed, where the pipeline rests on or below the ground, as well as bridge footings, which are pin piles driven into the ground to support the bridges where the pipeline runs across Streams 1 and 3.

TEMPORARY IMPACTS

Most of the project impacts will be temporary, consisting of construction access/staging; clearing and grubbing vegetation; excavation and backfill during pipeline installation. Temporary impacts will occur to Wetlands A, B, and C; Stream 4; and buffers. All temporarily impacted areas will be restored to existing or enhanced conditions after construction.



Legend

- Sheet reference
- Study area
- Proposed pipeline alignment
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)

Figure 5.
Key Map for the Wetland and Buffer Impacts for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

N

0 100 200 400 Feet

HERRERA

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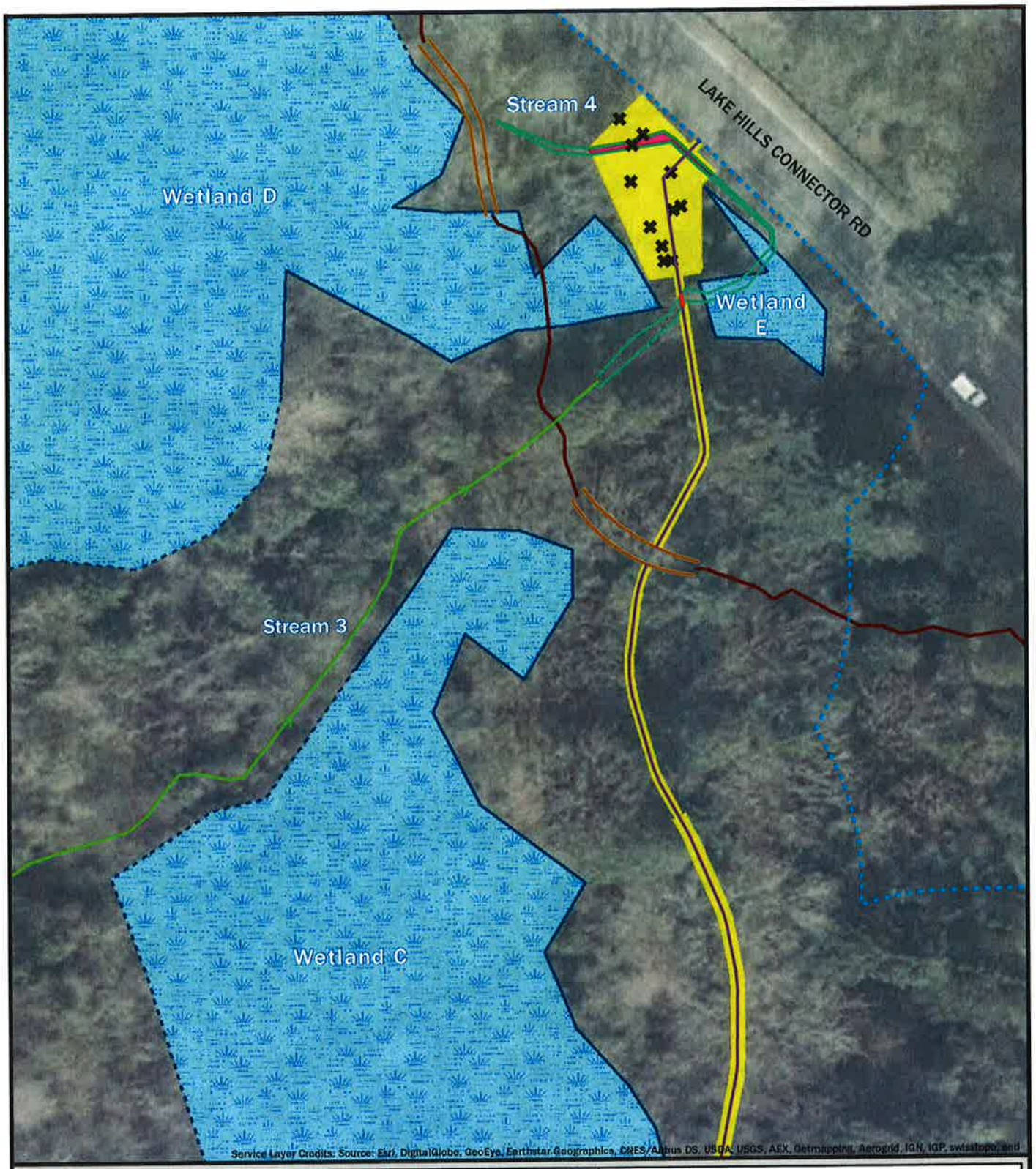

Legend

- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Tree removal
- Trail centerline (Bellevue)
- Trail edge (surveyed)
- Permanent wetland impact
- Permanent stream impact
- Permanent buffer impact
- Temporary wetland impact
- Temporary stream impact
- Temporary buffer impact

Figure 5a.
Wetland and Buffer Impacts for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

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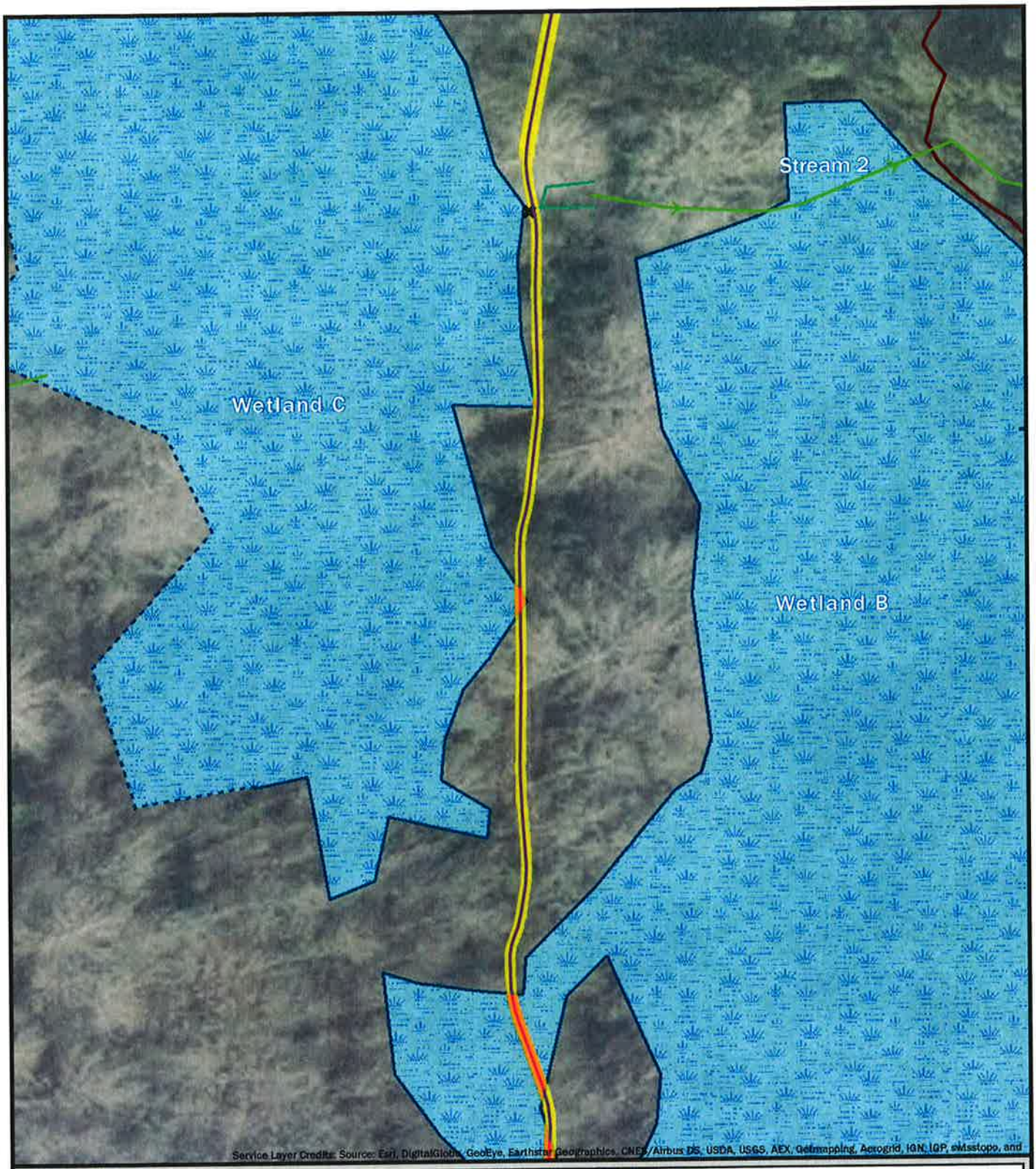

Legend

- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Tree removal
- Trail centerline (Bellevue)
- Trail edge (surveyed)
- Permanent wetland Impact
- Permanent stream impact
- Permanent buffer impact
- Temporary wetland impact
- Temporary stream impact
- Temporary buffer impact

Figure 5b.
Wetland and Buffer Impacts for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

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0 25 50 100 Feet

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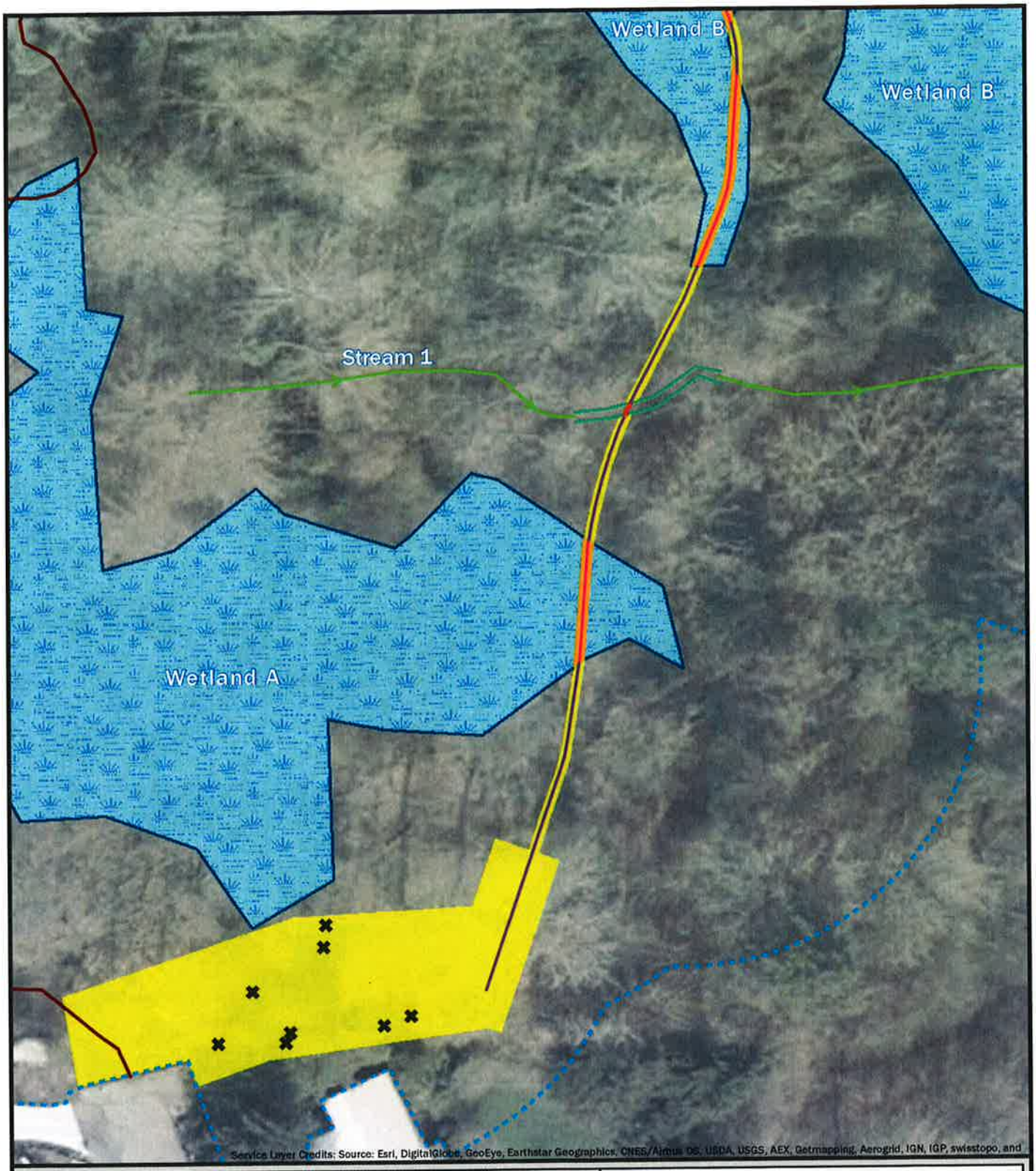

Legend

- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Tree removal
- Trail centerline (Bellevue)
- Trail edge (surveyed)
- Permanent wetland impact
- Permanent stream impact
- Permanent buffer impact
- Temporary wetland impact
- Temporary stream impact
- Temporary buffer impact

Figure 5c.
Wetland and Buffer Impacts for the Woodridge Open Space Sewer Replacement Project, Bellevue, WA.

N

0 25 50 100 Feet

HERRERA

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MITIGATION APPROACH

The proposed project design has avoided and minimized wetland, stream, and buffer impacts to the extent possible. Once construction is complete, temporary impact areas will be restored to preconstruction condition or enhanced to native conditions. Compensatory mitigation for permanent impacts will be provided by enhancing existing degraded wetlands, streams, and buffers within the Woodridge Open Space.

MITIGATION SEQUENCING

Impacts to critical areas and their buffers will be mitigated through a sequence of actions intended to maintain or improve ecological functions currently present at the site. The project follows requirements for mitigation sequencing as outlined in Bellevue LUC 20.25H.215; joint Ecology, Corps, and Environmental Protection Agency (EPA) guidance (Ecology 2006); and the State Environmental Policy Act (Washington Administrative Code Chapter 197-11-768). The project has made all reasonable efforts to avoid, minimize, rectify, reduce, and compensate for impacts on critical areas and buffers in a manner that maintains ecological functions of wetlands, streams, and buffers. Mitigation for the project will be achieved through the following sequence of actions.

Impact Avoidance

The project design seeks to avoid critical areas impacts to the maximum extent possible while achieving the project objective. During the design process, project engineers and biologists coordinated to select a sewer pipeline alignment that largely avoids permanent impacts on wetlands by constructing the pipeline mainly in buffer areas. The pipeline completely avoids Wetlands D and E, and limits impacts to Wetlands A, B, and C. Similarly, the pipeline alignment was selected to avoid impact to Stream 2. In addition, temporary staging areas at the northern and southern extents of the project were selected in areas that avoid wetlands and streams.

The project considered several stream crossing options, specifically examining the Stream 3 crossing location, and ultimately chose a pipe bridge option that will be used for crossing Streams 1 and 3. While these crossings will still represent a permanent stream impact, the selected design option avoids direct impact to stream banks and channel substrate (i.e., area waterward of OHWMs) (Tetra Tech 2016b, Appendix F). The pipe bridge footings will be located landward of the OHWM.

Complete avoidance of permanent impacts to wetlands, streams, and buffers is not feasible. Permanent impacts are unavoidable within the footprint of the pipeline. In select places, it is necessary to intrude within or cross wetlands with the pipeline alignment when weighing several

factors including topography, the need to maintain gravity flow, limitations in pipe flexibility to navigate around wetlands, and desire to preserve significant trees that are high-quality wildlife habitat. However, where permanent wetland impact is necessary, clearing of significant trees is avoided. The avoidance of buffer impacts is not feasible because wetland and stream buffer widths cover most of the upland areas within the study area. However, the pipeline alignment was carefully selected to largely avoid clearing of significant trees within buffer areas.

Impact Minimization

Originally, the project considered burying the full extent of the sewer pipeline replacement. This option would have required constructing a temporary access road adjacent to the pipeline alignment to allow for equipment to excavate a trench, bury the pipe, and backfill the trench. As a result, this option would have resulted in substantial grading and vegetation clearing within wetlands and buffers. These temporary impacts were substantially minimized by proposing to primarily place the pipeline on the ground surface.

Where possible, impacts on wetlands were minimized to the maximum extent by selecting a pipeline alignment that largely avoids impacts to Wetlands A, B, and C. Where intrusion into these wetlands is necessary, careful consideration was given to minimizing impact to the outer edges of wetlands or by crossing relatively narrow portions of the wetlands.

In selecting the pipe bridge design option over Streams 1 and 3, the project minimizes impact to stream buffers when compared to the open cut and boring options, which would have resulted in large areas of vegetation clearing (trees, shrubs, and groundcover) on each side of the streams (Tetra Tech 2016b, Appendix F). This will also minimize the potential effects to pileated woodpecker.

A portion of Stream 4 occurs within the downhill (north) construction staging area. Impacts to the stream channel and banks will be minimized by installing steel plates over the channel.

Impact Rectification

The project aims to rectify temporary impacts by restoring disturbed wetlands and buffers at a 1:1 (restoration area-to-impact area) ratio (Table 16 and Figure 6). Once construction of the pipeline is complete, construction and staging areas disturbed during construction of the pipeline will be restored with native vegetation consisting of trees, shrubs, and groundcover. The vegetation will grow to cover the pipeline within a few years, retaining the aesthetics of the Woodridge Open Space for park users. In addition, where it is necessary to clear trees, the trunks and limbs will be retained on site as downed wood within or directly adjacent to temporary impact areas. Trees will be felled in directions away from work areas. If felled trees interfere with installation of the pipeline, they will be relocated to the edge of the work area. After pipeline installation, felled trees will be repositioned within staging areas to support restoration of these areas. The downed wood will support buffer habitat function.

Table 16. Temporary Impact Rectification for the Woodridge Open Space Sewer Replacement Project.					
Impact Location	**Impact Type**	**Impact Area (square feet)**	**Proposed Mitigation Measure**	**Mitigation Replacement Ratio**	**Mitigation Area (square feet)**
Wetlands A, B, and C	Temporary	553	Restoration	1:1	663
Buffer	Temporary	14,085	Restoration	1:1	14,230
	Totals:	**14,638**			**14,893**

Impact Reduction Over Time

The City will reduce the impact of the project over time by monitoring the project, including the performance of native vegetation. All wetlands and buffers that are restored or enhanced with native vegetation will be monitored for a minimum of 5 years. Maintenance measures will be implemented as necessary during that 5-year period to ensure compliance with vegetation performance criteria. (See the *Monitoring, Maintenance, and Contingencies* section of this report.)

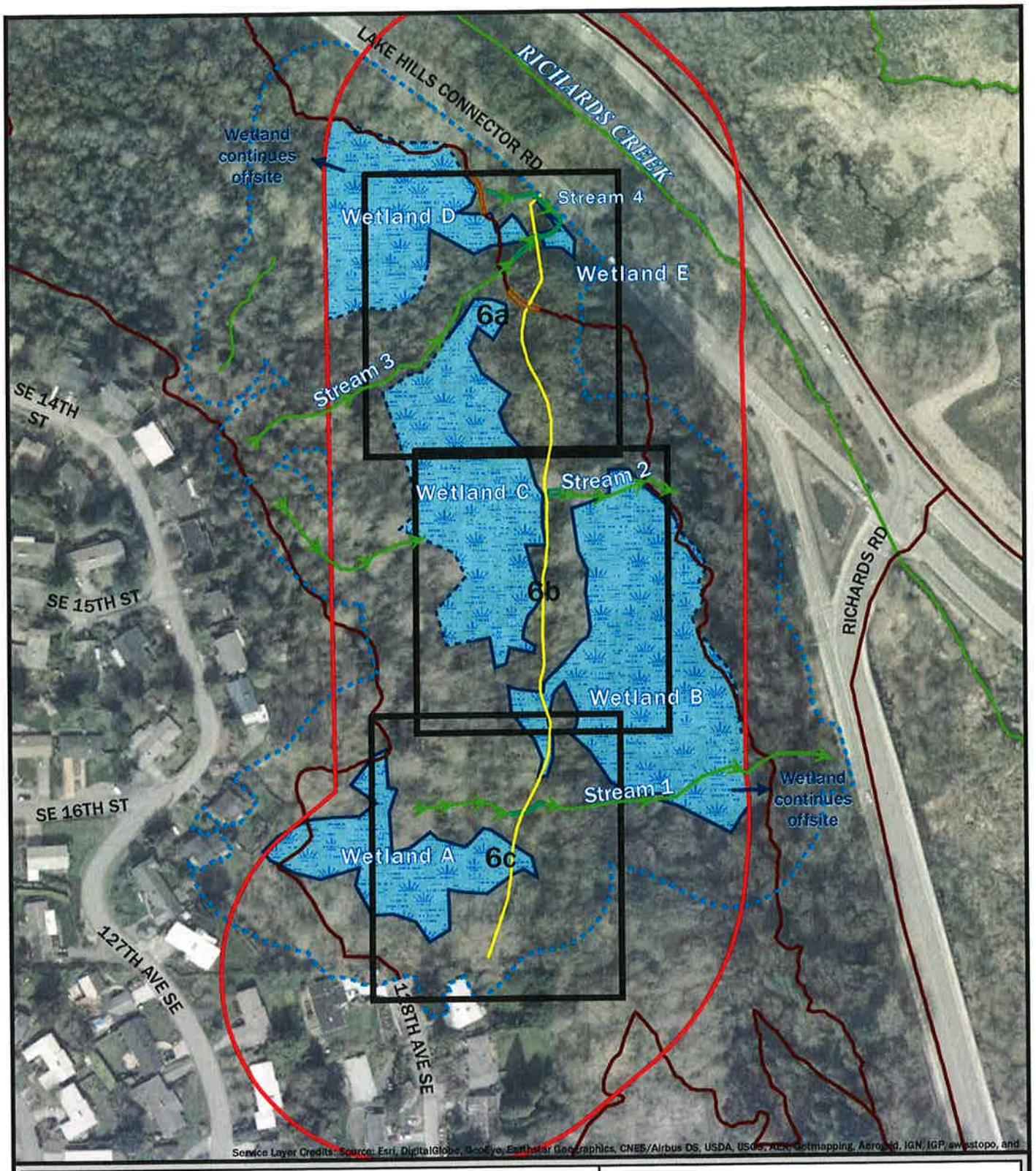
In addition, the City will monitor over a 5-year period for exposure of the abandoned sewer pipeline beneath stream channels. If the buried abandoned sewer pipeline becomes exposed at a stream crossing, the City will remove the exposed segment; and the remaining sewer pipeline will be capped in place beyond the banks at each side of the channel.

Impact Compensation

To compensate for permanent wetland, stream, and buffer impacts, compensatory mitigation will be on site and in kind, in accordance with Bellevue mitigation preferences (LUC 20.25H.105). The mitigation will consist of enhancing wetlands and buffers adjacent to the project area (Table 17 and Figure 6). Compensatory mitigation measures will support a no net loss of wetland and buffer functions as a result of the sewer replacement.

Table 17. Permanent Impact Compensation for the Woodridge Open Space Sewer Replacement Project.						
Impact Location	**Impact Type**	**Impact Area (square feet)**	**Proposed Mitigation Measure**	**Required Mitigation Replacement Ratio**	**Mitigation Requirement (square feet)**	**Actual Mitigation Area (square feet)**
Wetlands A, B, and C	Permanent	110	Enhancement	2:1	220	1,350
Streams 1 and 3	Permanent	12	Enhancement	N/A[a]	N/A[a]	13,619[a]
Buffers	Permanent	663	Enhancement	1:1	663	3,199
	Totals:	**785**			**883**	**18,168**

[a] Bellevue LUC does not provide required mitigation ratios for permanent stream impacts. In accordance with LUC 20.25H.085 permanent impacts resulting from bridging the pipeline over will be mitigated by enhancing the function of buffers surrounding the bridge sites by planting supplemental conifer trees.



Legend

- Sheet reference
- Study area
- Proposed pipeline alignment
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)

Figure 6.
Key Map for the Wetland and Buffer Mitigation for the Woodridge Open Space Sewer Replacement Project.

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0 100 200 400 Feet

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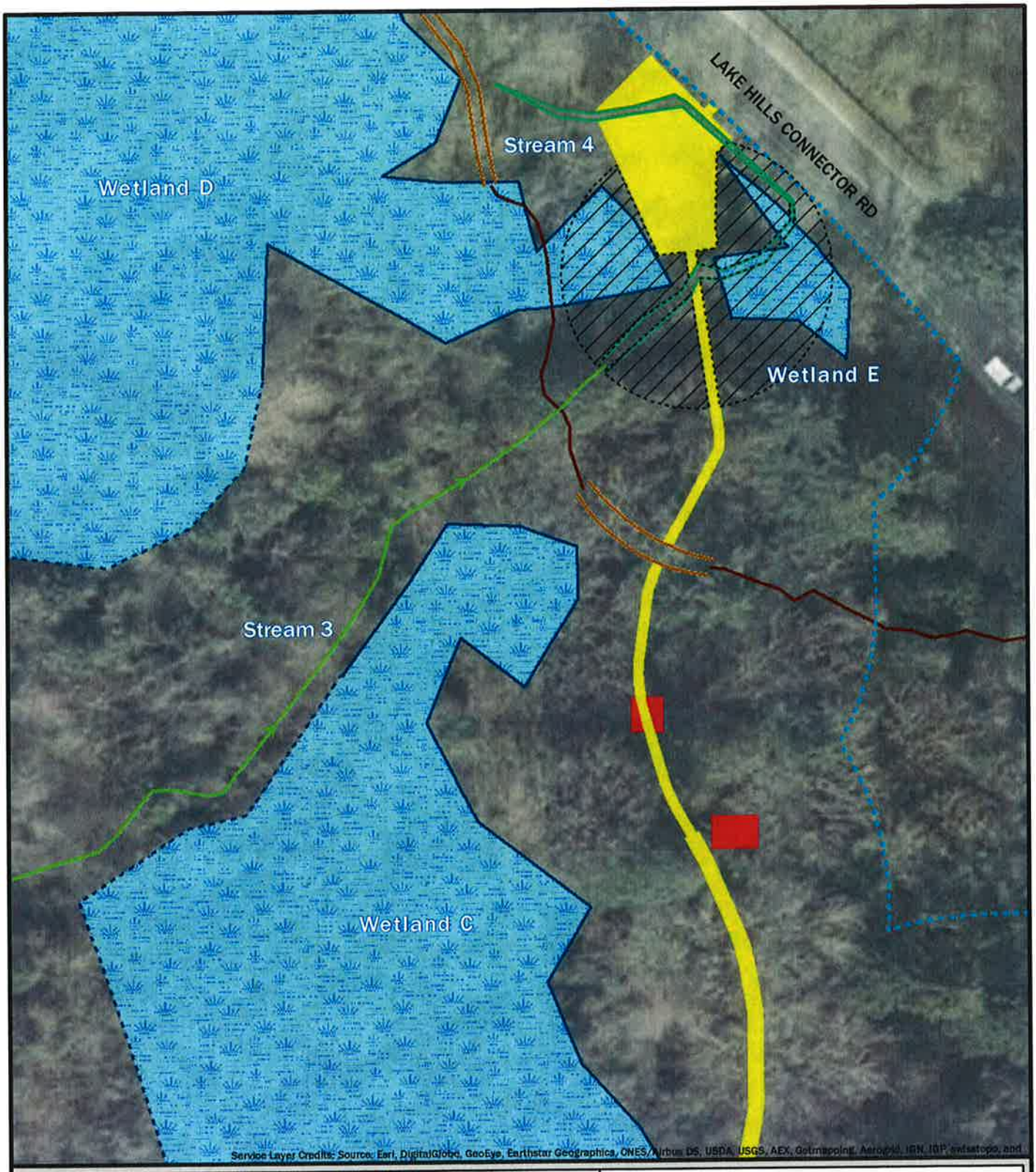

Legend

- Wetland enhancement
- Buffer enhancement
- Wetland restoration
- Buffer restoration
- Conifer planting enhancement
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)

Figure 6a.
Wetland and Buffer Mitigation for the Woodridge Open Space Sewer Replacement Project.

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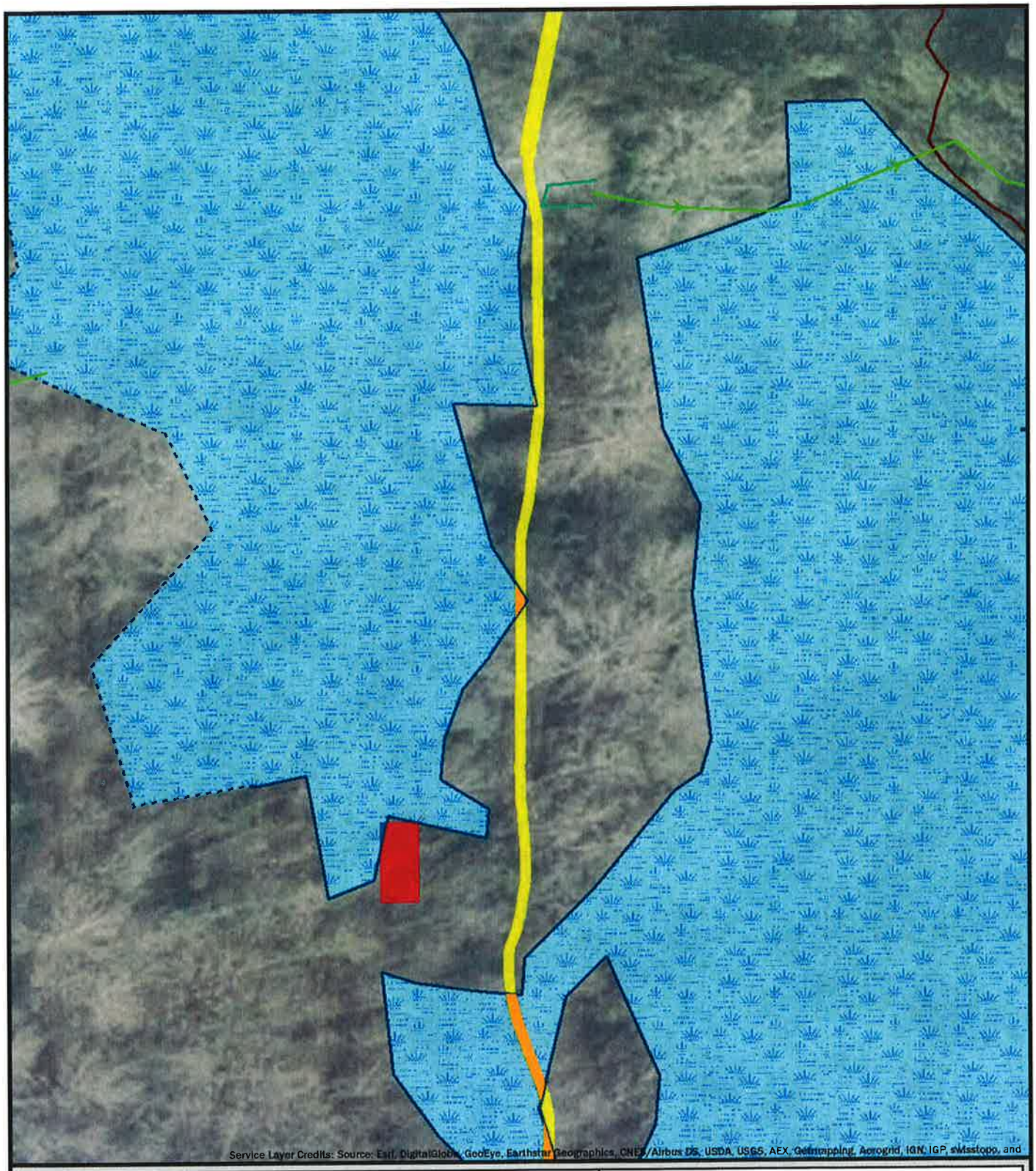

Legend

- Wetland enhancement
- Buffer enhancement
- Wetland restoration
- Buffer restoration
- Conifer planting enhancement
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)

Figure 6b.
Wetland and Buffer Mitigation for the Woodridge Open Space Sewer Replacement Project.

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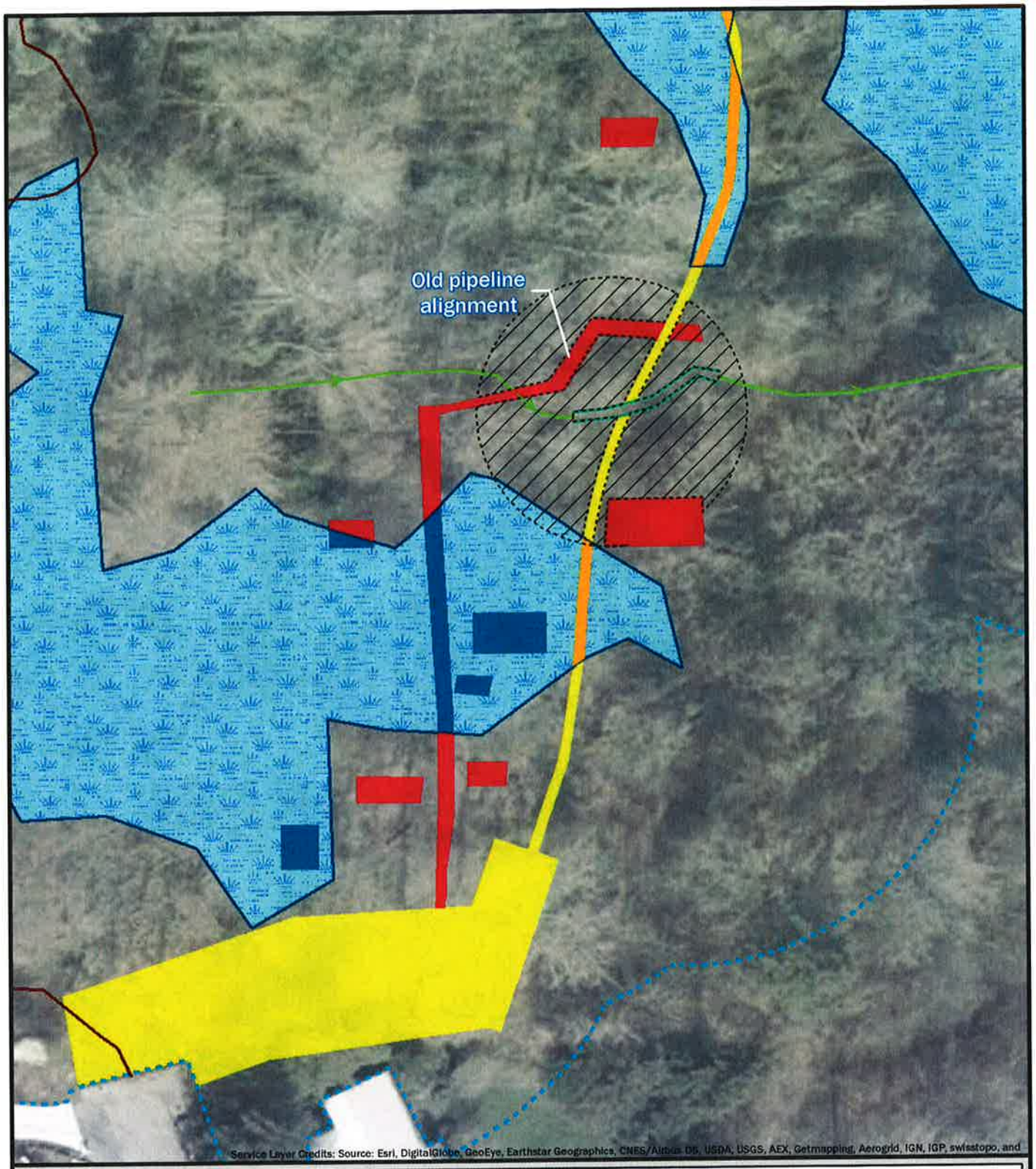

Legend

- Wetland enhancement
- Buffer enhancement
- Wetland restoration
- Buffer restoration
- Conifer planting enhancement
- Delineated wetland
- Wetland boundary (delineated)
- Estimated wetland boundary
- Ordinary high water line (delineated)
- Stream (Bellevue)
- Wetland and stream buffer
- Trail centerline (Bellevue)
- Trail edge (surveyed)

Figure 6c.
Wetland and Buffer Mitigation for the Woodridge Open Space Sewer Replacement Project.

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Compensatory mitigation for permanent wetland and buffer impacts will take place within the old sewer pipeline alignment and in areas covered in dense invasive trees, particularly cherry laurel (*Prunus laurocerasus*). The old pipeline alignment at the southern end of the project is devoid of vegetation, and the condition will be greatly improved by the addition of native vegetation. The large patches of cherry laurel within the wetlands and buffers are growing in thick monocultures and inhibiting the growth of native vegetation. The cherry laurel will be cut down and removed from the site, and the stumps will be treated with aquatically-approved herbicide in accordance with City of Bellevue regulations to keep the laurels from sprouting.

Compensatory mitigation for permanent buffer impacts will include enhancing existing wetland and stream buffers by planting native trees, shrubs, and groundcover at a 4:1 ratio (enhancement area-to-impact area). Compensatory mitigation for permanent wetland impacts will include enhancing existing wetland by planting native trees, shrubs, and groundcover at a 12:1 ratio (enhancement area-to-impact area).

The compensatory mitigation for permanent stream impacts will consist of enhancing the stream buffer in a 50-foot radius around each of the permanent stream impact areas (Streams 1 and 3) where pipeline bridging is proposed, referred to as conifer planting zones. Conifer trees will be installed in these zones amongst existing native vegetation. The conifer plantings will increase the diversity of tree species on the site and enhance habitat for pileated woodpeckers and other wildlife species.

Overall for the project, trees greater than 4 inches dbh that are removed during construction will be replaced at a 15:1 ratio.

A portion of the trees that are removed during the project will be placed within the channel of Stream 3 to provide additional mitigation for stream and buffer impacts. Logs will be placed with limbs attached and will crisscross each other within the channel, positioned parallel to the stream channel alignment. Placement of logs within the channel is anticipated to improve fish habitat condition by preventing further channel incision and supporting formation of pools.

MITIGATION SITE PLAN

The mitigation plan was prepared in accordance with Bellevue LUC 20.25H.220 (Mitigation and Restoration Plan Requirements) and LUC 20.25H.105 (Mitigation and Monitoring – Additional Provisions). The areas of temporary impact within the construction and staging areas will be restored after the pipeline is in place. Compensatory mitigation for permanent impacts due to the pipeline will be met through onsite and in kind wetland and buffer enhancement.

MITIGATION IMPLEMENTATION SCHEDULE

The project will adhere to the proposed construction schedule outlined in Table 18. Pipeline construction will occur during the summer months. Mitigation planting will occur during the first dormant plant season after construction is completed.

Table 18. Proposed Construction and Mitigation Schedule for the Woodridge Open Space Sewer Replacement Project.

Task	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Construction								2017	2017	2017		
Mitigation Planting										2017	2017	2017

MITIGATION PLANTING

Plant species proposed for mitigation are listed in Table 19 and a planting plan for the project is provided in Appendix G. Planting plans are consistent with guidelines presented in the City of Bellevue's *Critical Areas Handbook* (Bellevue 2003).

Within enhancement and restoration zones, trees will be spaced 8 feet on center, shrubs will be placed 4 feet on center, and groundcover will be placed 2 feet on center. In the conifer planting zones, conifer species will be planted 12 feet on center, amongst existing vegetation. Plant quantities are provided in Appendix G. Prior to planting, all invasive, nonnative vegetation will be removed by means of clearing and grubbing with handheld tools.

After planting, wood-chip mulch will be applied to each planting zone at a 3-inch depth to retain soil moisture and minimize colonization of vegetation that could interfere with their establishment. For all plantings, wood-chip mulch will be pulled back 3 inches from stems to prevent stem rot.

Table 19. Native Plant List for the Planting Zones for the Woodridge Open Space Sewer Replacement Project.

Common Name	Scientific Name	Stratum	Wetland Indicator Status	On Center Spacing (feet)
Wetland Enhancement and Restoration Zones				
Western red cedar	*Thuja plicata*	Tree	FAC	8
Black gooseberry	*Ribes lacustre*	Shrub	FAC	4
Black twinberry	*Lonicera involucrata*	Shrub	FAC	4
Pacific ninebark	*Physocarpus capitatus*	Shrub	FACW	4
Red-osier dogwood	*Cornus sericea*	Shrub	FACW	4
Salmonberry	*Rubus spectabilis*	Shrub	FAC	4
Swamp rose	*Rosa pisocarpa*	Shrub	FAC	4
Lady fern	*Athyrium filix-femina*	Groundcover	FAC	2
Buffer Enhancement and Restoration Zones				
Western red cedar	*Thuja plicata*	Tree	FAC	8
Western hemlock	*Tsuga heterophylla*	Tree	FACU	8
Bald hip rose	*Rosa gymnocarpa*	Shrub	FACU	4
Indian plum	*Oemleria cerasiformis*	Shrub	FACU	4
Salmonberry	*Rubus spectabilis*	Shrub	FAC	4
Red elderberry	*Sambucus racemosa*	Shrub	FACU	4
Red flowering currant	*Ribes sanguineum*	Shrub	FACU	4
Snowberry	*Symphoricarpos albus*	Shrub	FACU	4
Sword fern	*Polystichum munitum*	Groundcover	FACU	2
Conifer Planting Zones				
Douglas fir	*Pseudotsuga menziesii*	Tree	FACU	12
Western red cedar	*Thuja plicata*	Tree	FAC	12
Western hemlock	*Tsuga heterophylla*	Tree	FACU	12

MITIGATION GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

Enhancement and Restoration Zones

Goal

The goal of the enhancement and restoration zones is to enhance wetland and buffer habitats and restore temporarily disturbed wetland and buffer areas such that there is no net loss of wetland and buffer functions.

Objective

Within the wetland and buffer restoration areas, the objective is to plant a variety of native tree, shrub, and groundcover species that will develop into mature native vegetation. This mature vegetation will stabilize steep banks and cover the pipeline to preserve the natural aesthetics of Woodridge Open Space. Within the wetland and buffer enhancement zones, the objective is to remove invasive vegetation and plant a variety of native trees, shrubs, and groundcover that will develop into mature native vegetation. The native plants will improve the buffer functions for water quality improvement and stormwater infiltration by trapping sediments. They will improve hydrologic functions by infiltrating and slowing surface water flows during heavy rainfall events, and they will provide additional habitat by adding vegetation diversity to the site.

Performance Standards

Performance of the restoration and enhancement areas will be determined based on meeting standards for minimum plant survival, minimum cover of native woody vegetation, and maximum allowed cover of invasive, nonnative plant species over 5 years (Table 20). Invasive, nonnative species include any plants listed on King County Noxious Weed Lists (King County 2016b). Annual monitoring of the mitigation areas will be done for 5 years following planting.

Table 20. Performance Standards for the Wetland and Buffer Enhancement and Restoration Zones for the Woodridge Open Space Sewer Replacement Project.

Performance Standard	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	Year 4 (2021)	Year 5 (2022)
Plant Survival Rate (percent)	100	>90	>90	N/A	N/A
Native Vegetation Cover (percent)	>5	>10	>15	>20	>25
Invasive, Nonnative Plant Cover (percent)	<5	<5	<5	<5	<5

Year 1

- 100 percent of the planted species will have survived or will be replaced.
- Greater than 5 percent cover of native vegetation, excluding mature trees, will be present within planting zones.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 2

- Greater than 90 percent of the planted species will have survived or will be replaced.
- Greater than 10 percent cover of native vegetation, excluding mature trees, will be present within planting zones.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 3

- Greater than 15 percent cover of native vegetation, excluding mature trees, will be present within planting zones.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 4

- Greater than 20 percent cover of native vegetation, excluding mature trees, will be present within planting zones.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 5

- Greater than 25 percent cover of native vegetation, excluding mature trees, will be present within planting zones.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Conifer Planting Zones

Goal

The goal of the conifer planting zones is to enhance stream buffer conditions and improve buffer functions by planting native conifer tree species and removing invasive, nonnative species.

Objective

The objective is to plant conifer tree species that will develop into mature trees to provide habitat for pileated woodpeckers and other species, as well as to maintain native vegetation conditions with little to no presence of invasive, nonnative plants.

Performance Standards

Performance of the conifer zone will be determined based on meeting standards for minimum plant survival and maximum allowed cover of invasive, nonnative plant species over 5 years (Table 21). Invasive, nonnative species include any plants listed on the King County Noxious Weed Lists (King County 2016b). Annual monitoring of the mitigation areas will be done for 5 years following project construction.

Table 21. Performance Standards for the Conifer Planting Zones for the Woodridge Open Space Sewer Replacement Project.

Performance Standard	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	Year 4 (2021)	Year 5 (2022)
Plant Survival Rate (percent)	100	>95	>95	90	90
Invasive, Nonnative Plant Cover (percent)	<5	<5	<5	<5	<5

Year 1

- 100 percent of the planted species will have survived or will be replaced.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 2

- Greater than 95 percent of the planted species will have survived or will be replaced.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 3

- Greater than 95 percent of the planted species will have survived or will be replaced.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 4

- Greater than 90 percent of the planted species will have survived or will be replaced.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Year 5

- Greater than 90 percent of the planted species will have survived or will be replaced.
- Less than 5 percent cover of invasive, nonnative plants will be present within areas of planted vegetation.

Abandoned Sewer Pipeline Monitoring

Goal

The goal of the abandoned sewer pipeline monitoring is to ensure the buried sewer pipeline does not become exposed in the future.

Objective

Within the portions of the site where the abandoned sewer pipeline crosses beneath stream channels, the objective is to assess the area annually to ensure that the buried sewer pipeline does not become exposed due to the natural erosion and incision of the stream channels.

Performance Standards

Performance of the abandoned sewer line will be determined based on meeting standards for exposure of the sewer line over 5 years following project construction.

All Years

- The abandoned sewer pipeline beneath stream channels will not become exposed.

MONITORING, MAINTENANCE, AND CONTINGENCIES

MONITORING

Monitoring of planting zones will take place for a minimum of 5 years. Starting the first year after plant installation (Year 1), the City will arrange for a qualified biologist to conduct monitoring visits each year to evaluate compliance with performance standards. Monitoring will include evaluating plant mortality; establishing photo points; documenting cover of native and invasive, nonnative species; and monitoring for exposure of the abandoned sewer pipeline beneath stream channels. Incidental observation of wildlife or evidence of wildlife presence (e.g., scat or tracks) will be recorded during each monitoring visit, with a special emphasis on pileated woodpeckers.

Upon completion of each site visit, the qualified biologist will prepare a monitoring report that documents the monitoring methods, results, photo documentation, and any necessary contingency and maintenance measures. The report will include photos and approximate locations of invasive, nonnative plants that need to be removed or controlled. The report will be submitted to the City's Development Services Department before the end of each monitoring year.

MAINTENANCE AND CONTINGENCIES

During Year 1, the planting contractor will be responsible for achieving 100 percent plant survival and successful establishment of planted vegetation within the planting zones. In accordance with Year 1 plant establishment requirements, the contractor will provide necessary maintenance of planted vegetation on a monthly basis for a period of 365 days after acceptance of initial planting. Plant establishment maintenance will include, but is not limited to, supplemental irrigation during summer months; removal and control of invasive, nonnative vegetation; replenishing of wood-chip mulch as necessary; and replacing plants that have died. Before plants are replaced, the contractor will consult with the project biologist assigned by the City's Development Services Department to determine why certain species are not surviving and, if necessary, which native plant substitutions are appropriate.

The City will arrange for annual maintenance of the planting zones during Years 2 through 5, with the goal of meeting all the applicable performance standards. If success criteria for percent coverage of woody plants and invasive, nonnative species have not been satisfied, maintenance activities may include, but are not limited to, plant replacement, plant substitution, adjustment

of the planting layout to reflect specific or changing site conditions, weed control, and installation and adjustment of plant protection devices.

If during annual monitoring, the buried abandoned sewer pipeline is observed as exposed at a stream crossing, the City will be alerted. The City will remove the exposed segment, and the remaining sewer pipeline will be capped in place beyond the banks at each side of the channel.

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APPENDIX A

Geologic Hazard Areas Report

APPENDIX ARE IN FILE

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